

# INDEX OF SUBJECTS

## ABSTRACTS A and B, 1932.

An asterisk denotes a previous abstract. Patents are marked (P.)

Abaca fibres, tensile strength of, and effect of air-drying thereon, B., 766.  
 Abietenes, sulphonated, use of, as wetting agents, B., 172.  
 Abietic acid, constitution of, and its derivatives, A., 1036.  
   carbon skeleton of, A., 1254.  
   manufacture of, (P.), B., 1091.  
   sodium salt, products of action of sodium hydroxide and heat on, A., 612.  
   esters, manufacture of, (P.), B., 688.  
     additive compounds of, with maleic anhydride, and their derivatives, A., 1254.  
   ethyl ester, dielectric constant and power factor of, A., 447.  
   glycol esters, production of, (P.), B., 1072.  
   detection of, B., 71.  
 Aborigines, Australian, basal metabolism of, A., 1280.  
 Abortion, contagious, in cattle, relation of nutrition to, A., 872.  
 Abradants, water-resistant binding agent for, (P.), B., 902.  
 Abrasives, manufacture of, (P.), B., 24, 423, 937, 1032.  
   from ceramic-bonded alumina granules, (P.), B., 105.  
   coating of paper, etc., with, (P.), B., 984.  
   use of, in rubber, B., 519.  
 Abrasive articles, manufacture of, (P.), B., 106.  
 Abrasive materials, manufacture of, from steel, (P.), B., 267.  
   thermoplastic, (P.), B., 726.  
 Absorption and diffusion, A., 992.  
 Absorption apparatus for use with expired air of laboratory animals, A., 1182.  
   for corrosive or inflammable vapours, A., 1227.  
 Absorption coefficients of colourless sols, A., 993.  
   for towers, B., 451.  
 Absorption spectra. See under Spectra.  
 Absorption transitions, formula for, A., 892.  
 Abutic acid, and its dimethyl ester, A., 860.  
 Abutilon *avicennae*, growth and anthocyan formation in, A., 101.  
 Acacias, dye from wood of, and its derivatives, A., 1256.  
*Acacia catechu*, lac infection of, B., 851.  
 Acantite, crystal structure of argentite and, A., 114.

Accumulators, (P.), B., 514.  
   covers for, (P.), B., 390.  
   electrodes for, (P.), B., 352.  
   negative electrodes for, (P.), B., 945.  
   plates and rubberseparators for, (P.), B., 473.  
   sulphation of lead plates of, B., 1088.  
   pole bridge for, (P.), B., 473, 1089.  
   separators for, (P.), B., 914.  
   rubber separators for, (P.), B., 1043.  
   stopper for, (P.), B., 115.  
   measurement of internal resistance of, A., 592.  
   alkaline, negative electrodes for, (P.), B., 113.  
   iodine, B., 645.  
   lead, A., 580.  
 Acenaphthatriazine, 7-nitro-1-amino-, A., 67.  
 2:3-Acenaphthbenzopyrylium salts, and 7-hydroxy-, A., 750.  
 Acenaphthene, purification of, (P.), B., 497.  
   crystal structure of compound of styphnic acid with, A., 564.  
 Acenaphthene, 5-thiol-, and its salts, A., 839.  
 Acenaphthenes, diamino-, diacetyl derivatives, A., 854.  
 Acenaphthene-2:7-dicarboxylic acid, A., 854.  
 Acenaphthenequinone, derivatives of, A., 286.  
   dyes from, A., 67.  
 Acenaphthenequinone series, A., 286.  
 Acenaphthene-5-sulphonic acid, derivatives of, A., 839.  
 Acenaphthenesulphonic acids, A., 839.  
 Acenaphthenone, A., 750, 1041.  
 Acenaphthindole, and its *N*-methyl derivative, A., 1041.  
 5-Acenaphthylthiolacetic acid, and its sodium salt, A., 839.  
 Acetal, gaseous decomposition of, A., 1002.  
 Acetals, decomposition of, catalytically, by aluminium oxide, A., 44.  
   cyclic, rate of hydrolysis of, A., 932.  
 Acetaldehyde, manufacture of, from acetylene, (P.), B., 459, 832.  
   production of acetic acid and, from acetylene, (P.), B., 972.  
   electric moment of, A., 1077.  
   oxidation of, A., 253, 1210.  
   polymerisation of, A., 1212.  
   condensation of, with aniline, A., 1124.  
   with cyanoacetic acid, A., 1119.  
   reactions of, over oxide catalysts, A., 478.

Acetaldehyde tetramethyldimethylene- and tetramethylene-acetals, A., 932.  
   enzymic dismutation of, A., 1066, 1287.  
   formation of, in adrenalectomy, A., 644.  
   in pancreatic digestion and irradiation of proteins, A., 543.  
   determination of, in presence of ethyl alcohol, A., 632.  
 Acetalylthiocarbimide, and its reaction with primary amines, A., 864.  
 Acetamide, manufacture of, (P.), B., 792.  
   saponification of, A., 916.  
 Acetamide, cyano-, condensation of, with hydroxymethylene-ketones, A., 521.  
 Acetamide hydrochloride, amino-, benzoyl and *p*-toluenesulphonyl derivatives, A., 936.  
 Acetanilide, and its derivatives, heat of activation and action constant of, A., 234.  
   saponification of, A., 916.  
   action of phosphorus pentachloride on, A., 623.  
 Acetanilides, halogeno-, reaction of, with phenylhydrazine, A., 50.  
 Acetanilide-*p*-thioarsinic acid, esters of, A., 70.  
 Acetantranilamide-5-arsinic acid, A., 180.  
 Acetantranilic acid, 5-amino-, derivatives of, A., 180.  
 Acetantranilic acid 4-arsenoxide, A., 180.  
 Acetate ions, equivalent conductance of, A., 914.  
 Acetic acid, preparation of, from methyl alcohol and carbon monoxide, B., 12.  
   manufacture of, (P.), B., 792.  
   from acetaldehyde, (P.), B., 221, 493, 590.  
   from acetylene, (P.), B., 459, 832.  
   and acetaldehyde from acetylene, (P.), B., 972.  
   use of rubber hose in, B., 365.  
   corrosion of plant for, B., 493.  
   extraction of, from aqueous solution by light petroleum, A., 331.  
   recovery of, from pine charcoal kilns, B., 972.  
   by the Suida process, B., 791.  
   in relation to method used for wood distillation, B., 55.  
   purification of, electrolytically, (P.), B., 646.  
   separation of, from its anhydride, (P.), B., 172, 221, 792, 1071.  
   removal of water from, (P.), B., 94, 493.

Acetic acid, concentration of, (P.), B., 12, 94, 486, 763, 792, 1071.  
 refractive indices of mixtures of, with amines, A., 1197.  
 absorption spectra of, in liquid and gaseous states, A., 444.  
 Raman spectrum of, A., 213.  
 ionisation constant of, A., 695, 1089.  
 heat capacities of mixtures of water and, A., 222.  
 specific heat of aqueous solutions of, A., 1091.  
 m.p. of mixtures of, with phenylhydrazine, A., 340.  
 partition of, between water and toluene, A., 1198.  
 equilibria of, in binary systems with amines, A., 1204.  
 with ethyl acetate, ethyl alcohol, and water, A., 117.  
 primary, secondary, and total medium effects of, A., 700.  
 velocity of esterification of aliphatic alcohols by, A., 1210.  
 catalysis by hydrogen chloride of esterification of, by ethyl alcohol, A., 578.  
 oxidation of, by potassium persulphate, A., 929.  
 preparation of acetone from, A., 1019.  
 formation of succinic acid from, A., 831.  
 glacial, industrial analysis of, B., 251.  
 detection of, in formic acid, B., 540.  
 determination of, in cellulose acetate, B., 96.  
 in silage, B., 1129.  
 determination in, of mineral acid, B., 12.  
 Acetic acid, salts, constitution of, in solution, A., 22.  
 effect of, on composition of blood and urine, A., 774.  
 conductometric and potentiometric determination of, A., 231.  
 alkali salts, manufacture of, (P.), B., 260.  
 fused, electrolysis of, A., 1213.  
 ammonium salt, as a buffered standard, A., 813.  
 ammonium and potassium salts, evaluation of solutions of, B., 575.  
 basic beryllium salt, polarisation of solutions of, A., 983.  
 calcium salt, formation of gels of, in soils, B., 477.  
 lead salt, action of, with iodides, A., 1011.  
 determination of acetic acid in, B., 62.  
 lead subsalt, strong solutions of, B., 1119.  
 potassium salt, electrolysis of, A., 580.  
 sodium salt, latent and specific heats of, A., 1081.  
 sodium uranyl zinc salt, solubility of, in alcohol, A., 711.  
 thallium salt, in relation to hæmatoporphyrinuria, A., 1164.  
 complex vanadium compounds of, A., 31.  
 zinc salt, slow hydrolysis of, A., 917.  
 Acetic acid, esters, manufacture of, from the calcium salt, (P.), B., 792.  
 amyl ester, determination of, in air, colorimetrically, A., 632.  
 2-benzamidophenyl ester, A., 51.  
 butyridene ester, rate of formation of, A., 474.  
 decomposition of, A., 702.  
 5:8-dichloro-1:4-dimethylantranil ester, A., 1135.  
 ergosteryl esters, A., 267, 268.  
 ethyl ester, manufacture of, (P.), B., 493.  
 catalytic synthesis of, from acetaldehyde, A., 579.  
 free energy of formation of, A., 695.

Acetic acid, ethyl ester, vapour pressure of mixtures of ethyl alcohol and, A., 1197.  
 influence of neutral salts on rate of hydrolysis of, A., 27.  
 reaction of, with ferric chloride, A., 719.  
 ethylidene ester, decomposition of, A., 232.  
 $\alpha$ -phenyl- $n$ -amyl-, ethyl-, and -propyl esters, A., 1028.  
 $o$ - $\beta$ -phenylpropionamidophenyl ester, A., 1026.  
 and *mono*- and *tri*-chloro-, spinasteryl esters, A., 381.  
 Acetic acid, amino- and oximino-cyano-, acetyl derivatives, ethyl esters, A., 727.  
 bromo-, effect of, on metabolism, A., 1285.  
 effect of, on oxygen consumption by muscle, A., 1285.  
 salts, kinetics of reaction of, with thiosulphates, A., 815, 1211.  
 sodium salt, reaction between sodium methoxide and, A., 127.  
 chloro-derivatives, and their esters, heats of combustion of, A., 1206.  
 chloro-, adsorption of, from solution, A., 459.  
 reduction of, A., 479.  
 $p$ -bromophenacyl ester, A., 1249.  
 trichloro-, kinetics of decomposition of, in aqueous solution, A., 475.  
 salt formation by dimethylaminoazobenzene and, in indifferent media, A., 22.  
 $perchloro$ -, A., 1109.  
 cyano-, condensation of, with acetaldehyde, A., 1119.  
 ethyl ester, conductivity of electrolytes in, A., 699.  
 halogeno-derivatives, action of, on hydrolysis and oxidative metabolism, A., 1065.  
 iodo-, effect of, on glycolysis in muscle, A., 704.  
 $mono$ - and  $di$ -thio-, dimethyleneammonium salts, A., 48.  
 Acetic acids, disubstituted, containing a methyl group, maximum rotations and correlation of, A., 1233.  
 Acetic anhydride, manufacture of, (P.), B., 12, 221, 332, 670, 763, 972.  
 from ethylidene diacetate, (P.), B., 670.  
 separation of acetic acid from, (P.), B., 172, 221, 792, 1071.  
 magneto-optical dispersion of, A., 323.  
 equilibrium of, with water, A., 913.  
 esterification of, in alcoholic solution, A., 232, 233.  
 Acetic-4-arsino- $N$ -acetanthranilic anhydride, A., 180.  
 $di$ -Acetic- $\alpha$ -isobutyric acid, imino- and its hydrochloride, A., 49.  
 Acetic- $\alpha$ -propionic acid, imino-, and its derivatives, A., 49.  
 Acetimino-2-methylindole, 3-trichloro-, A., 59.  
 Acetoacetic acid, action of methylglyoxal on, A., 646.  
 esters, substituted, enolisation of, A., 1203.  
 ethyl ester, derivatives of, A., 402.  
 isomerism of condensation products of, with benzylamine, A., 257.  
 reaction of, with choleic acid, and its additive compound with deoxycholic acid, A., 366.  
 fermentation with yeast in presence of, A., 194.  
 transformation of, by yeast, A., 305, 306.  
 production of, by liver, A., 1287.

Acetoacetic acid,  $\alpha$ -amino-, acetyl derivative, ethyl ester, A., 727.  
 oximino-, ethyl ester, reduction of, A., 170.  
 Acetoacetone naphthylamides, A., 840.  
 Acetoacetoxyhydrides, A., 840.  
 Aceto- $o$ -anisidide, sulphonation of, A., 378.  
*Acetobacter xylinum*, cellulose from, A., 968.  
 X-ray spectrum of, A., 307.  
 Acetobromoanhydroglucose, A., 1237.  
 1:6-Acetodibromogalactopyranose, A., 369.  
 Acetobromoglycerinaldehyde, derivative of, with potassium ethyl xanthate, A., 45.  
 Acetogalactose,  $\beta$ -amino-, A., 1118.  
 Acetoglucose,  $\beta$ -amino-, and its hydrochloride, A., 1118.  
 Acetoin, production of, by *Thermobacterium mobile*, A., 631.  
 from action of pepsin on milk, A., 1287.  
 Aceto-3-methoxy-2-ethoxytoluene. See Methoxyethoxyacetophenone.  
 Aceto-2-methylnaphthalenes, and their derivatives, A., 1250.  
 Aceto- $\alpha$ -naphthalide, 8-thiol-, additive compound of, with stannic chloride, A., 176.  
 1-Aceto-3-naphthhydroxamic acid, 2-hydroxy-, A., 743.  
 1-Aceto-3-naphthoic acid, 2-hydroxy-, and its derivatives, A., 743.  
 Acetone, molecular structure of, A., 798.  
 formation of, by catalytic decomposition of acetic acid, A., 235.  
 preparation of, from acetic acid, A., 1019.  
 production of, (P.), B., 172.  
 from acetylene, (P.), B., 832.  
 by fermentation, (P.), B., 525, 573.  
 Raman spectrum of, A., 793.  
 vibration spectrum of, A., 897.  
 electrical conductivity of, A., 23.  
 effect of potential difference on, A., 9.  
 and chloro-, electric moments of, A., 1077.  
 magnetic susceptibility of mixtures of, with chloroform, A., 1083.  
 cryoscopy of, in potassium chloride solutions, A., 804.  
 in water and sodium chloride solutions, A., 570.  
 gaseous, oxidation of, A., 474.  
 surface tension of, A., 1078, 1200.  
 solubility of alkali halides in, A., 1197.  
 effect of water and alcohols on solubility of salts in, A., 1197.  
 physical properties of mixtures of, with bromoform, A., 801.  
 equilibrium of, with  $n$ -butyl alcohol and water, A., 687.  
 with methyl alcohol, A., 1197.  
 and bromo-, rates of enolisation of, A., 129.  
 decomposition of mixtures of, with ethyl and methyl ethers, A., 1209.  
 hydrolysis of, by ultra-violet light, A., 1215.  
 reduction of, with lead-sodium alloy, A., 49.  
 condensation products of, with cresol, A., 842.  
 preparation of keten from, A., 932, 1019.  
 action of, with aluminium bromide or chloride, A., 583.  
 with carbon disulphide, A., 145.  
 dimethylene- and methyl dimethyl-acetals, A., 932.  
 2:4-diphenylsemicarbazone, A., 942.  
 $p$ -nitrophenylsemicarbazide, A., 598.  
 phenylhydrazones, reaction of, with phenylcarbimide, A., 942.  
 production of, biologically, A., 1066.  
 effect of, on acetic acid fermentation, A., 94.

- Acetone, as alcohol substitute in histology, A., 786.  
distribution of, in cold-blooded animals, A., 87.  
detection of, A., 1235.  
in presence of aldehydes, A., 1051.  
in urine, A., 535.  
determination of, iodometrically, A., 1115.  
in admixture with organic solvents, B., 56.  
in urine, A., 640.
- Acetone, bromo-, and chloro-, semicarbazones of, A., 368.  
*di*hydroxy-, acetals from, A., 367.
- Acetones, halogenated, acid and base catalysis in bromination of, A., 577.
- Acetone oil, white, B., 590.
- Acetonebiscarbitioic acids, and their derivatives, A., 145.
- Acetone-chloroform. See *tert*-Butyl alcohol, *aaa*-trichloro-.
- Acetonedicarboxylic acid, condensation of, with phenols and their ethers, A., 512.
- Acetonedicarboxynaphthylamides, A., 840.
- Acetonitrile, hydrolysis of quaternary ammonium bases of, A., 1211.
- Acetonitrile, amino-, chloroacetyl and *p*-toluenesulphonyl derivatives, A., 936.
- 4-Acetonyl-3-(4'-nitro-2'-methylphenyl)-3,4-dihydrophthalazine, 1-hydroxy-, A., 405.
- Acetonyl-3-nitrophthalimide, A., 1231.
- Aceto-*p*-phenetidine. See Phenacetin.
- Acetophenone, catalytic production of, A., 478.  
condensation of, with bromo- and chloro-vanillins, A., 515.  
derivatives,  $\omega$ -substituted, A., 334.
- Acetophenone, *p*-amino-, *p*-toluenesulphonyl derivative, A., 375.  
*p*-amino-, *p*-bromo-, *p*-chloro-, and *p*-iodo-, dipole moments of, A., 322.  
 $\omega$ -amino-, and its salts, A., 54.  
4-bromo- and 4-chloro-nitro-, A., 949.  
2,4:6-tribromo-, influence of *o*-bromine atom in, and *aaa*-2,4:6-hexabromo-, 2,4:6-tribromo-3-cyano- and -3-hydroxy-, and *aaa*-trichloro-2,4:6-tribromo-, A., 514.  
*di*- and *tri*-chloro- and *dichloro*- $\omega$ -amino- and - $\omega$ -hydroxy-, and their derivatives, A., 1245.  
 $\omega$ -*di*- and  $\omega$ -*tri*-chloro-, reactions of, A., 59.  
 $\omega\omega$ -*dichloro*- and  $\omega$ -trichloro-*m*-amino-, and their derivatives, and  $\omega$ -trichloro-*m*-nitro-, A., 59.  
4-chloro-3-nitro-, and 3-nitro-4-amino-, and their derivatives, and 3-nitro-4-cyano-, A., 1135.  
cyano-oximino-, derivatives of, A., 272.  
 $\omega$ -halogeno-derivatives, interaction of, with bases, A., 744, 1241.  
 $\omega$ -4-*di*hydroxy-, derivatives of, A., 859.  
 $\omega$ -substituted derivatives, reactions of, A., 1241.
- Acetophenone-3:5-dicarboxylic acid. See 5-Acetylisophthalic acid.
- Acetophenylacetamide, A., 387.
- 2-Acetosalicosyl-1-acetylalazarin, and its methyl ether, A., 370.
- 2-Acetosalicosylalazarin, A., 370.
- 8-Acetosalicosylchrysazin, and its derivatives, A., 370.
- $\beta$ -Acetostyrylamide, A., 387.
- Acetosuccinic acid, ethyl ester, condensation of, with phenols, A., 520.
- 2-Acetothienone-indopheninesulphonic acid, A., 752.
- Acetotoluene, 2-nitro-4-trichloro-, A., 59.
- 3-Acetoxyiminomethyl-1:2:5-oxadiazole, 4-amino-, A., 1267.
- 1-Acetoxy-2-acetoglucosoxyanthraquinone-9-imine, derivatives of, A., 603.
- 1-Acetoxy-2-acetoglucosoxyanthraquinone-9-acetimine, A., 370.
- $\omega$ -Acetoxyacetophenone, 4-amino-, A., 750.
- 8-Acetoxy-7-acetyl-1:3-dimethylxanthine, A., 1044.
- 4'-Acetoxy-5-*O*-acetyl- $\beta$ -glucosidoxy-3-*O*-tetra-acetyl- $\beta$ -glucosidoxyflavylium chloride, 7-hydroxy-, A., 1141.
- 8-Acetoxy-7-acetyl-1-methylxanthine, A., 1044.
- 7-Acetoxy-6-acetyl-3-phenyl-4-methylcoumarin, A., 861.
- 5-Acetoxy-7-acetyl-1:3:9-trimethyldihydro-uric acid, 4-chloro-, A., 1045.
- 8-Acetoxy-7-acetyl-xanthine, A., 1044.
- 9-Acetoxy-10-allylretene, A., 165.
- o*-Acetoxybenzoic acid (*acetylsalicylic acid*; *aspirin*), stability of, B., 622.  
determination of, in presence of 2-phenyl-quinoline-4-carboxylic acid, A., 955.  
determination of morphine in mixtures with, B., 623.
- 8-Acetoxycaffeine, A., 1044.
- $\beta$ -Acetoxydibenzyl,  $\alpha$ -amino-, acetyl derivative, A., 609.
- 4-Acetoxy-2:2-dimethyl-2:5-dihydro-oxazole, A., 865.
- 8-Acetoxy-1:7-dimethylxanthine, A., 1044.
- 2-Acetoxydiphenyl-3-carboxylic acid, manufacture of, (P.), B., 1137.
- $\alpha$ -Acetoxy- $\alpha\beta$ -diphenyloxan, A., 63.
- N*-( $\alpha$ -Acetoxyethyl)-*N'*-acetylcarbamide,  $\beta\beta$ -trichloro-, A., 151.
- 1-Acetoxymercuri-2-naphthol nitrate, A., 1050.
- $\omega$ -Acetoxy- $\omega$ -methoxyacetophenone, A., 851.
- 4'-Acetoxy-3'-methoxy-3:5-di-(*O*-tetra-acetyl- $\beta$ -glucosidoxy)flavylium chloride, 7-hydroxy-, A., 1141.
- 7-Acetoxy-4-methyl-3-coumarinyl-3'-coumarin, A., 519.
- 8-Acetoxy-7-methylxanthine, A., 1044.
- 2-Acetoxy-2'-nitrodiphenyl, A., 152.
- 4-Acetoxy-5-phenyl-2:2-dimethyl-2:5-dihydro-oxazole, A., 865.
- 2-Acetoxyretene, A., 165.
- $\alpha$ -Acetoxyisuberic acid, diethyl ester, A., 721.
- 2'-Acetoxy-3:4:3':4'-tetramethoxyphenyl styryl ketone *di*bromide, A., 621.
- 2-Acetoxy-2:3:5:6-tetraphenyl- $\Delta^6$ -dioxen, A., 63.
- 3-Acetoxy-1-thionaphthen, A., 64.
- 2'-Acetoxy-4:3':4'-trimethoxyphenyl styryl ketone *di*bromide, A., 621.
- 4-Acetoxy-2:2:5-trimethyl-3:5-dihydro-oxazole, A., 865.
- $\kappa$ -Acetoxy- $\eta$ -undecenoic acid, 1-hydroxy-, A., 833.
- Acetyl chloride, and chloro-, electric moments of, A., 1077.  
spontaneous polymerisation of, A., 526.  
reaction of, with *m*-chlorotoluene, A., 1133.  
groups, determination of, A., 498, 500, 1051.  
iodide, and chloro-, reaction of, with ethers, A., 1017.  
peroxide, chloro- and iodo-, A., 1109.
- 1-Acetyl-2-acetamidomethylpiperidine, A., 256.
- p*-Acetylacetoacetanilide, A., 402.
- Acetylaceto-*NN'*-diethylamidine, and its salts, A., 371.
- Acetylacetone, additive compound of, with ethyl acetoacetate, A., 366.
- Acetylacetone, beryllium compound, polarisation of solutions of, A., 983.  
niobates, A., 484.
- Acetylacetoneazodiphenylmethylpyrazole, A., 169.
- 1-Acetyl-8-acetosalicosylchrysazin, A., 370.
- $\beta$ -Acetylacrylic acid,  $\alpha$ -amino-, ethyl ester, A., 49.
- 2-Acetylanthraquinone, 5:8-*di*hydroxy-, and its acetyl derivative, A., 1135.
- Acetyl-*dl*-arginine, A., 1238.
- Acetylation, effect of diet on, A., 772.
- 2-Acetyl-6:7-benzanthraquinone, 5:8-*di*hydroxy-, A., 1135.
- Acetylbenzofurazan-4:7-quinone 7-oxime, A., 52.
- 4-Acetylbenzoic acid, 2-amino-, 2-hydroxy- and 2-nitro-, and their derivatives, and 2-cyano-, methyl ester, A., 1135.
- 1-Acetyl-3:2-*o*-benzylene-3-methylindoline, 2-amino- and 2-hydroxy-, and its acetyl derivative, A., 1261.
- 6-Acetyl-2-benzyl-naphthalene, and its oxime, A., 839.
- N*-Acetyl-2-*p*-bromophenyl-1:2-dihydro-1:2:3:4-tetrazine, A., 172.
- $\alpha$ -Acetyl- $\alpha$ -butyrylglutaric acid, ethyl ester, A., 1112.
- $\alpha$ -Acetyl- $\alpha$ -butyrylsuccinic acid, ethyl ester, A., 1112.
- 3-Acetyl-5-carbethoxy-4-methyl-*mono*- and -*di*-chloromethylpyrrole, and their derivatives, A., 1045.
- Acetyl-7-carboxymethoxy-4-methylcoumarin, and its derivatives, A., 521.
- Acetylcarnitine, A., 1046.
- Acetyltrichloromethylbenzoic acids, 2-*tri*-chloro-, esters of, A., 851.
- Acetylcholine, hydrolysis of, A., 967.  
in warm-blooded animals, A., 765.  
action of, on muscle, A., 190.  
chloride, injection of solutions of, B., 286.  
determination of, in presence of adrenaline, choline, and histamine, A., 966.
- Acetylcresotic acid, cholesteryl ester, A., 381.
- Acetylcryptopyrrole, A., 1263.
- Acetyl- $\psi$ -cumene, derivatives of, A., 851.
- Acetyldicyanophenylhydroxylamine, and its derivatives, A., 377.
- Acetyldihydroderitol methyl ether, A., 950.
- 1-Acetyl-3:1'-*di*-indolyl sulphide, A., 753.
- 2-Acetyl-4-(3':4'-dimethoxyphenyl)thiazole, A., 758.
- 7-Acetyl-3:9-dimethyl-4:5-dihydrouric acid, 4-chloro-5-hydroxy-, derivatives of, A., 1045.
- Acetyldimethylmangostin, derivatives of, A., 855.
- 3-Acetyl-3:7-dimethylphthalide, A., 1256.
- 4-Acetyl-3:5-dimethylpyrazole-4-carboxylic acid, ethyl ester, A., 931.
- 7-Acetyl-1:9-dimethyluric acid, A., 1044.
- 7-Acetyl-3:9-dimethyluric acid, reactions of, and 5-hydroxy-4-amino-, and their derivatives, A., 1044.
- Acetylene, formation of, from methane, A., 580.  
manufacture of, (P.), B., 221, 633.  
from ethylene dichloride, (P.), B., 331.  
from hydrocarbons in the electric arc, (P.), B., 410, 586.  
generators for, (P.), B., 493.  
water-locks for, (P.), B., 378.  
purification of, (P.), B., 491, 762.  
storage of, (P.), B., 171.  
and its halogen derivatives, spectra of, A., 675.  
infra-red absorption spectrum of, A., 1075.

- Acetylene, vibration-rotation spectrum of, A., 982.  
ionisation of, by electron impact, A., 321.  
 $M/N$  ratio for, A., 479.  
value of  $C_v$  for, A., 1189.  
vibration of, A., 320.  
entropy of, A., 1205.  
catalytic hydrogenation of, A., 918.  
catalytic addition of hydrogen chloride to, A., 819.  
slow combustion of, A., 347.  
flame temperatures of mixtures of air, methane, and, A., 127.  
polymerides of, and their derivatives, A., 40, 1231; B., 156.  
photochemical chlorination of, B., 540.  
photochemical action of, with water, A., 480.  
photochemical polymerisation of, A., 349.  
thermal polymerisation of, in presence of zinc chloride, A., 141.  
reaction of, with hydrogen bromide, A., 1232.  
with nitric acid, A., 171, 1145.  
derivatives, A., 730.  
isooxazole derivatives of, A., 286, 1145.  
removal of, from gases, (P.), B., 55.  
transformation of, by *Mycobacterium lacticola*, A., 1169.
- Acetylene, dibromo-, isomeric change of, A., 706.  
dichloro-, preparation of, A., 1232.  
diiodo-, molecular compound of, with dioxan, A., 719.
- Acetylenes, production of additive compounds of, (P.), B., 1071.
- Acetylene series, syntheses in, A., 141.
- Acetylenedicarboxylic acid, "dien"-syntheses with, A., 55.  
methyl ester, reaction of, with diethylamine, and its derivatives, A., 727.  
with pyrazoles, pyrazoles, glyoxalines, and quinolines, A., 1144.
- Acetylenediureincarboxylic acid, hydroxy-, and its silver salts, A., 864.
- Acetylenic compounds, refractivity of, A., 447.  
spectrochemistry of, A., 362, 374.
- $\alpha$ -Acetyethyl  $\beta$ -hydroxy- $\beta$ -methylpropyl ether, A., 363.
- $O$ -Acetylevernic acid, methyl ester, A., 742.
- $O$ -Acetylevernic acid, A., 742.
- 2-Acetyluran, 5-nitro. See 2-Furyl methyl ketone, 5-nitro-.
- 2- $O$ -Acetyl- $\beta$ -glucosidylphloroglucinaldehyde, A., 1141.
- $\gamma$ -Acetylglyceraldehyde, derivative of, with benzyl chloride, A., 367.
- Acetylglycine, chloro-, A., 957.
- Acetylhomopyrrolecarboxylic acid, A., 1263.
- 8-Acetylhexahydrocarbazole, 10:11-dihydroxy-, A., 168.
- $N$ -Acetylhistamine chloroaurate, A., 285.
- $dl$ - $N$ -Acetyldiiodotyrosine, and its esters, A., 1130.
- Acetyl-lactamidobenzaldehyde, A., 623.
- Acetyl- $d$ -leucyl- $d$ -leucyl- $d$ -leucine, chloro-, A., 1269.
- Acetyl- $dl$ -leucylpyridonium betaine, A., 194.
- Acetylmercurihexa-acetylmercuriaurin, dihydroxy-, A., 410.
- Acetylmercurihydroxy- $\beta$ -naphthoic acids, anhydrides of, A., 410.
- Acetylmesitylene, halogen derivatives of, A., 1134.
- Acetylmethionines, A., 1238.
- $N$ -Acetyl- $p$ -methoxyphenylalanine, A., 612.
- 3-Acetyl-6- $p$ -methoxystyryl-2:4-pyrone, and its derivatives, A., 748.
- 2-Acetylmethylantraquinone, 5:8-dihydroxy-, A., 1135.
- Acetylmethylcarbinol from sucrose fermentation by *B. subtilis*, A., 652.  
detection of, in foods, B., 749.
- Acetylmethyldialuric acid, A., 523.
- Acetylmethyldihydrodermitol oxime, A., 400.
- 5-Acetyl-10-methyl-5:10-dihydrophenarsazine, 10:10-dihydroxy-, A., 630.
- 5-Acetyl-3-methyl-4-ethylpyrrole-2-carboxylic acid, ethyl ester, A., 174.
- Acetyl-2-methylindole, 3-trichloro-, A., 59.
- Acetylmethylmalonic acid, ethyl ester, pyrazolone from, A., 602.
- 2-Acetyl-1-methylcyclopentanes, and their derivatives, A., 514.
- 1-Acetyl-3-methylcyclopentane-1-acetic acid, and its derivatives, A., 740.
- 2-Acetyl-1-methyl- $d^1$ -cyclopentene, and its derivatives, A., 514, 744.
- Acetyl-4-methylmelliferone, and its semicarbazone, A., 521.
- Acetylnaphthalene, 1:5-dibromo-, A., 851.
- Acetylnaphthalene-1:5-dicarboxylic acid, A., 851.
- 2:1-Acetylnaphthoic acid, and its derivatives, A., 851.
- Acetyloleanolic acid, derivatives of, A., 1035.
- Acetyloxaloacetic acid, derivatives of, A., 1247.
- 5-Acetylisooxazole, and its derivatives, A., 1145.
- Acetylphenanthrene, 9-bromo-, and its derivatives, A., 1029.
- Acetyl- $p$ -phenetylcaramide, cyano-, A., 756.
- $N$ -Acetyl- $N'$ -phenyl- $N$ -methylcarbamide,  $N$ -cyano-, A., 525.
- 4-Acetylphenylthiourethane, A., 154.
- 4-Acetylphthalic acid, and its derivatives, A., 1135.
- 4-Acetylisophthalic acid, and trichloro-, and its ethyl hydrogen ester, A., 851.
- 5-Acetylisophthalic acid, and its silver salt and derivatives, A., 851.
- 4-(Acetylpiperazino)-6-methoxy-2-methylquinoline, 4:4'-chloro-, salts of, A., 168.
- Acetylpodophyllotoxin, A., 1137.
- Acetyl- $l$ -proline, A., 1238.
- Acetylpropionic acid,  $\alpha$ -amino-, and its trihydrate, A., 936.
- 3-Acetylsopropylidenequinamide, A., 849.
- $O$ -Acetylrhizonic acid, derivatives of, A., 850.
- Acetylricinolic acid, methyl ester, A., 43.
- Acetylsalicylic acid. See  $O$ -Acetoxybenzoic acid.
- $N$ -Acetylsarcosine amide, A., 1041.
- Acetylthephrosin, A., 950.
- Acetyltetraphthalic acid, and trichloro-, A., 851.
- 9-Acetyltetrahydrocarbazole, dibromide of, A., 168.
- Acetyltetrahydronaphthacarbazoles, bromination of, and 5-bromo-, A., 1039.
- 8-Acetyltetrahydropentindole, mono- and di-bromo-, A., 169.
- Acetyltetrahydrostrychnine, and its methiodide, A., 407.
- 2-Acetylthiazoles, synthesis of, A., 758.
- 8-Acetylthiolindoles, and their derivatives, A., 753.
- $dl$ - $N$ -Acetylthyroxine,  $O$ -methyl derivative, A., 1130.
- Acetyltoluenes, 3-chloro- and 3-chloronitro-, and their semicarbazones, A., 1133.
- $\alpha$ -Acetyl- $\alpha$ -trimethylacetylglutaric acid, ethyl ester, A., 1112.
- $\alpha$ -Acetyl- $\alpha$ -trimethylacetylnaccinic acid, ethyl ester, A., 1112.
- 1-Acetyl-2:2:4-trimethyldihydroquinoline, A., 1142.
- 1-Acetyl-1:2:2-trimethylcyclopentane, 3-cyano-, and its derivatives, A., 276.
- 1-Acetyl-1:2:2-trimethylcyclopentane-3-carboxylic acids, and their derivatives, A., 276.
- 1-Acetyl-1:2:2-trimethyl- $d^2$ -cyclopentene 2:4-dinitrophenylhydrazones, A., 277.
- Acetyltryptophans, and their salts, A., 753.
- Acetyltubaic acid, derivative of, by ozonolysis, A., 739.
- $l$ - $N$ -Acetyltyrosine, A., 612.
- 7-Acetyluvic acid, A., 1044.
- Acetylxylin, from deciduous trees, chain length of, A., 934.
- Acid,  $C_6H_5O_2$ , and its  $p$ -iodophenacyl ester, from oxidation of tetrahydro-tubaic acid, A., 400.
- $C_6H_5O_2Cl$ , from formaldehyde and dichloroethylene, A., 721.
- $C_6H_5O_2$ , from action of *Penicillium* on glucose, A., 651.
- $C_8H_{10}O_2$ , from hydrolysis of ethyl  $\alpha$ -carbethoxy- $\beta$ -phenyl- $\alpha$ -methylglutamate, A., 1128.
- $C_{12}H_{20}O_2$ , from hydrogenation of cinnamylidenemalonamic acid, A., 614.
- $C_{14}H_{12}O_2$ , by oxidation of 3:4'-dimethyldiphenyl, A., 1121.
- $C_{10}H_{12}O_4N_2$ , and its isomer, perchlorates of, from hydrogenation of carboxyapocynine, A., 407.
- $C_{20}H_{22}O_6N_2$ , and its salts, from oxidation of brucinonic acid, A., 866.
- $C_{21}H_{22}O_6N_2$ , and its salts, from oxidation of hexahydrostrychnine, A., 179.
- $C_{22}H_{18}O_7$ , from hydrolysis of additive compound of maleic anhydride and  $\alpha$ , $\beta$ -diphenylethylene, A., 56.
- $C_{31}H_{48}O_3$ , and its derivatives, from oxidation of sugar-beet sapogenin, A., 46.
- $C_{46}H_{52}O_{10}N_4$ , and its derivatives, from methylation of bisdehydrovomicinic acid, A., 408.
- $C_{50}H_{52}O_{10}N_4$ , and its derivatives, from dihydrovomicinic acid, A., 179.
- $C_{48}H_{58}O_{10}N_4$ , and its dimethyl ester, from  $O$ - $N$ -dimethylvomicinic acid, A., 179.
- $C_{55}H_{81}O_{13}S$ , and its derivatives, from neem oil, A., 517.
- Acids, constitution of, as solids and in solution, A., 572.  
electrolytic dissociation of, in salt solutions, A., 124, 572.  
ionisation constants of, in aqueous-alcoholic solutions, A., 912.  
effect of solvent on activity of, A., 339.  
distribution of, between water and immiscible solvents, A., 1084.  
adsorption of, by active carbon, A., 118.  
catalysis by, in aqueous and aqueous-alcoholic solutions, A., 917.  
acidity of, and their alteration by solvents, A., 467.  
automatic control of acidity of baths of, B., 323.  
sour taste of, A., 343.  
denitration of, (P.), B., 340.  
repairs to plant containing, B., 1027.  
production of, by *Aspergillus niger*, A., 1168.  
aliphatic, and their esters, catalytic production of, (P.), B., 301.  
concentration of, (P.), B., 792.  
salts, production of, from low-boiling hydrocarbons, (P.), B., 878.  
esters, production of, (P.), B., 301.



Acids, aliphatic, imide and amide chlorides of, A., 371.  
 with bactericidal properties, surface tension of, A., 690.  
*monobasic*, adsorption of, by sugar charcoal, A., 223.  
*dicarboxylic*, capillary activity of, A., 804.  
 oxidation of, electrolytically, A., 832.  
 dilute, neutralisation of, (P.), B., 927.  
 lower, concentration of, (P.), B., 94.  
 phenyl-substituted, A., 846.  
 volatile, surface tension of binary mixtures of, A., 456.  
 aromatic, alkaline esters, A., 846.  
 as local anaesthetics, (P.), B., 288.  
 acetyl-carboxylic and *polycarboxylic*, synthesis of, A., 851.  
 identification of, by phenacyl and bromophenacyl esters, A., 530.  
 asymmetric, affinity between bases and, A., 1089.  
*monobasic*, silver salts, reaction of, with iodine, in presence of *cyclohexene*, A., 1120.  
 long-chain, polymorphism of, A., 904.  
*polybasic*, condensation products of polyhydric alcohols and, (P.), B., 154, 272.  
*carboxylic*, optical rotation in homologous series of, A., 365.  
 ultra-violet absorption spectra of, A., 674.  
 catalytic hydrogenation of, (P.), B., 94.  
 alkyl esters, manufacture of, (P.), B., 590.  
 formation of amines from, by action of azoinide, A., 1030.  
 substituted, constitution of, A., 44, 360.  
*monocarboxylic*, oxidation of, with chromic acid, A., 719.  
*dicarboxylic*, oxidation of, by chromic acid, A., 833.  
 complex, A., 999.  
 ethylenic, higher, fatty, isomerism of, A., 1111.  
 fatty, manufacture of, (P.), B., 313.  
 from fatty oils, etc., (P.), B., 612.  
 from paraffin hydrocarbons, (P.), B., 516.  
 separation of unsaponifiable matter from, (P.), B., 1040.  
 recovery of, from oxidation products of hydrocarbons, (P.), B., 138.  
 concentration of, (P.), B., 878.  
 electrolysis of binary mixtures of, A., 930.  
 f.p. of, in benzene and nitrobenzene solutions, A., 334.  
 adsorption of, by powdered gold in various solvents, A., 689.  
 and their halogen derivatives, distribution of, between water and olive oil, A., 438.  
 and their derivatives, stabilisation of, (P.), B., 560.  
 stabilisation of substances containing, (P.), B., 649.  
 autoxidation of, A., 931.  
 hydrogenation of, (P.), B., 516.  
 acid salts of, A., 1018.  
 alkali-metal salts, manufacture of, (P.), B., 56.  
 manufacture of alkaline or ammoniacal sulphites or hyposulphites of, (P.), B., 995.  
 esters, manufacture of, (P.), B., 491.  
 electric moments of, A., 1077.

Acids, fatty, preparation of mixed esters of amino-acids and, A., 364.  
 halogen alkyl esters of, (P.), B., 946.  
*p*-halogenophenacyl esters of, A., 744.  
 reduction of bromides of, A., 42.  
 $\alpha$ -oxidation of, in muscle, A., 1058.  
 from cassava starch, A., 832.  
 $\omega$ -benzoylated, preparation of, A., 1233.  
 branched-chain, of high molecular weight, preparation of, A., 831.  
 brominated, reactions of, with thiocyanates, A., 916.  
*dicarboxylic*, dimorphism of, A., 326.  
 higher, production of, by oxidation of mineral oils, B., 790.  
 surface activity of salts of, A., 119.  
 manufacture of derivatives of, (P.), B., 973.  
 with branched carbon chain, A., 720.  
 liquid and solid, separation of, B., 993; (P.), B., 616.  
 mixed, titre points of, B., 849.  
 saturated, lattice constants of, A., 12.  
 ultra-violet absorption spectra of, A., 212.  
 polymorphism of, A., 1192.  
 higher, determination of, in edible fats, B., 647.  
 unsaturated, and their derivatives, A., 252, 832.  
 autoxidation of, A., 1112.  
 selective hydrogenation of, A., 252.  
 bromine derivatives of, (P.), B., 448.  
 need of the body for, A., 646.  
 rôle of, in the organism, A., 531.  
 higher, methyl esters, polymerisation of, A., 498.  
 water-soluble, distinction between, by shaking with light petroleum, A., 719.  
 determination of titre of, B., 515.  
 determination of, in soaps loaded with clay, B., 993.  
 determination in, of water, B., 70, 152.  
 mineral, determination of, in acetic acid, B., 12.  
 organic, manufacture of, from oxidised non-aromatic compounds, (P.), B., 590.  
 ionisation of, A., 984.  
 dissociation constants of, A., 342.  
 adsorption of, on charcoal, A., 803.  
 photochemical decomposition of, A., 480.  
 and their salts, photochemical decomposition of, in ultra-violet light, A., 1006.  
 alkali salts, assay of, B., 636.  
*p*-phenylphenacyl esters, A., 745.  
 formation of, by moulds, A., 651.  
 by fermentation of carbohydrates, A., 968.  
 substituted, affinity constants of, A., 338.  
 detection of, A., 931.  
 phenolic, A., 410, 1031, 1246.  
 strong and weak, potential effect on conductivity of, A., 813.  
 unsaturated, and their esters, addition of halogens to, A., 475.  
 reduction of, at a dropping mercury cathode, A., 1234.  
 esters, action of ammonia and amines on, A., 600, 1246.  
 $\alpha$ -unsaturated, synthesis of, from malonic acid, A., 1129.  
 weak, mobility of anions of, A., 914.  
 complex formation in, A., 22, 228, 231, 814.  
 reactions of, A., 572.

Acids, identification of, A., 529.  
 use of thionylaniline as reagent for, A., 867.  
 electrometric titration of, in presence of salts of weak base, A., 472.  
 determination of, electrometrically, in cells and tissues, A., 550.  
 Acid-base regulation and energy metabolism, A., 298.  
 Acid chlorides, action of, with hydrogen selenide, A., 382, 849.  
 with hydrogen sulphide, A., 55, 268.  
 with sodium azide, A., 1118.  
 aliphatic, preparation of, (P.), B., 494.  
 aromatic, reaction of, with potassium pyrosulphite, A., 1246.  
*monocarboxylic*, manufacture of, (P.), B., 1113.  
 of dibasic acids, catalytic reduction of, A., 499.  
 "Acidoproteolytes," proteases of, A., 545.  
 Acidosis, A., 535.  
 Aconite, physiological standardisation of preparations of, B., 1054.  
 determination of alkaloids in, B., 863.  
 Aconite alkaloids, A., 178, 629.  
 distinction of aconitine from, B., 623.  
 Aconitic acid, equilibrium of, in aqueous solutions, A., 696.  
 Aconitine, distinction of total alkaloids of aconite from, B., 623.  
 Acraldehyde (*acrolein*), preparation and determination of, A., 145.  
 Acridine, A., 754, 862.  
 derivatives, manufacture of, (P.), B., 368, 528.  
 coloured compounds of, with iodine, A., 281.  
 Acridine dyes, manufacture of, (P.), B., 96.  
 Acridone, 3-bromo- and 3-fluoro-, A., 754.  
 7-chloro- and 7-fluoro-nitro-, A., 862.  
 Acridones, formation of, by condensation of *o*-nitrobenzaldehydes with aromatic hydrocarbons, A., 169.  
 synthesis of, A., 754.  
 Acridones, 3-nitro-, synthesis of, A., 862.  
 Acropeptides, A., 529.  
 Acrylic acid, manufacture of, (P.), B., 832.  
 and its derivatives and homologues, polymerisation of, (P.), B., 72, 172.  
 esters, manufacture of, (P.), B., 251.  
 Actinium, determination of, in uranium minerals, A., 590.  
 Actinium emanation. See Actinon.  
*Actinomyces*, pigment from, A., 884.  
 action of chloroform and ether on, A., 654.  
 Actinon,  $\gamma$ -rays from, A., 671.  
*Actinophleus Macarthurii*, lycopene in fruit of, A., 1178.  
 Activator-Z, A., 967.  
 Activity and particle size, A., 702.  
 Activity coefficients, A., 227.  
 measurement of, by base-exchange, A., 696.  
 in relation to freezing point, A., 696.  
 of salts in acetic acid solutions, A., 339.  
 Acylamino-acids, halogeno-, stereoisomeric, elimination of halogen by dilute alkali from, A., 149.  
 Acyldiaminoacridines, manufacture of, (P.), B., 657.  
 Acylaminobenzenearsinic acids, hydroxy-, esters, manufacture of, B., 657.  
 2-Acylaminobenzenearsinic acids, manufacture of 1-alkoxy- and 1-substituted-alkoxy-derivatives of, (P.), B., 818.  
 Acyloins, decomposition of, thermally, A., 834.  
 Adaline, detection of, B., 702.

- Addison's disease, catalase in, A., 535.  
 Adenine-nucleotide, A., 1150.  
   in blood and bile, A., 531.  
   in frog's hearts, A., 771.  
 Adenosine, ring structure of, A., 285.  
   derivatives of, in frog's hearts, A., 771.  
 Adenosinephosphoric acid, co-enzyme action of, A., 305.  
 Adenosinetriphosphatase of liver, A., 1288.  
 Adenosinetriphosphoric acid, A., 1064, 1287.  
   activation by, A., 778.  
 Adenylic acid, A., 1150.  
   preparation of, A., 1273.  
   hydrolysis of, with guanylic and xanthylic acids, A., 71.  
 Adenylpyrophosphatase, specificity of, A., 92.  
 Adenylpyrophosphoric acid, constitution of, A., 1274.  
 Adhesives, (P.), B., 35, 235, 274, 316, 521, 780.  
   manufacture of, (P.), B., 118, 272.  
   from cellulose derivatives, (P.), B., 121.  
   from dextrin, (P.), B., 783.  
   from rubber, (P.), B., 739.  
   from starch, (P.), B., 698.  
   preservation of, B., 690, 1094.  
   containing rubber, (P.), B., 903.  
   waterproof, manufacture of, (P.), B., 439, 951.  
   waterproof and heat-resistant, (P.), B., 121.  
 Adipialdehyde dioxime, A., 1114.  
 Adipic acid, *p*-bromophenacyl ester, A., 1249.  
   *p*-phenylphenacyl ester, A., 745.  
    $\beta$ -keto- $\alpha$ -acyl derivatives, ethyl esters, cleavage of, A., 1112.  
 Adipic acid,  $\alpha\alpha'$ -diamino-, A., 1118.  
 Adonitol triphenyl methyl ether, A., 42.  
 Adrenal cortex, effect of, on sexual functions, A., 1291.  
   hormone from, A., 969.  
 Adrenal glands, function of, in perfusion of extremities, A., 546.  
   prepotent function of, A., 969.  
   carotene from, A., 76.  
   effect of removal of, on cholesterol metabolism, A., 1160.  
 Adrenalectomy, A., 535.  
 Adrenaline, formation of, in suprarenals, A., 970.  
   from suprarenals of dogs in hæmorrhage and poisoning, A., 425.  
   effect of bacterial toxin on, A., 307.  
   absorption of, by blood-corpuscles, A., 198.  
   decomposition of, A., 54.  
   pharmacology of, A., 198.  
   physiological action of, and its destruction in the body, A., 1171.  
   hyperglycæmia from, A., 546.  
   prevention of inflammation by, A., 780.  
   increase in plasma fat after injection of, A., 780.  
   effect of irradiated amino-acids on vascular action of, A., 647.  
   effect of cocaine on cardio-vascular action of, A., 773.  
   influence of *d*- $\psi$ -cocaine on hypertensive action of, A., 88.  
   effect of, on blood cholesterol, A., 780.  
   on blood-iodine, A., 885.  
   on blood-sugar, A., 885.  
   on calcium in the organism, A., 970.  
   on lipin excretion, A., 1292.  
   on frog's liver, A., 188.  
   on muscle-glycogen, A., 779.  
   on lactic acid in muscle, A., 885.  
   on muscle-sugar, A., 546.  
 Adrenaline derivatives, therapeutic activity of, A., 301.  
   classification of amines related to, A., 845.  
   halogen analogues of, A., 1245.  
   determination of, A., 1051.  
   perfusion fluid for, in blood, A., 1067.  
 Adsorbents, manufacture of, (P.), B., 465, 506.  
   from metallic oxides, (P.), B., 465.  
   heat of wetting of, A., 460.  
   pressure of adsorbed air on surfaces of, A., 1084.  
   revivification of, (P.), B., 465, 831.  
   treatment for, with large capillaries, A., 688.  
   removal of vapours of liquids of high boiling point from, (P.), B., 10.  
   activated, manufacture of, (P.), B., 506.  
   granular, regeneration of, (P.), B., 868.  
   powdered, heat of wetting of, A., 333.  
 "Adsorgan," adsorption of intestinal gases by, A., 426.  
 Adsorption, Langmuir's theory of, A., 991.  
   measurement of absolute amount of, A., 331.  
   isotherms of, A., 118, 1084.  
   effect of  $X$ - and  $\gamma$ -rays on, A., 1084.  
   effect of concentration on, B., 873.  
   thermal and velocity data for, A., 568.  
   kinetics of, A., 118, 687.  
   reversal of Traube's rule for, A., 689.  
   and capillary condensation, A., 1084.  
   interfacial reactions in, A., 909.  
   relation of, to catalysis, A., 1095.  
   of mixed organic acids by active charcoal, A., 332.  
   of binary mixtures, A., 459.  
   of electrolytes by crystals, A., 223, 332.  
   of gases, A., 118, 331, 568, 688.  
   theories of, A., 687.  
   of ions of radio-active elements and dyes by salts, A., 118.  
   from solutions, A., 991.  
   at surfaces of heteropolar crystals, A., 688.  
   on solid surfaces, A., 688.  
   at surfaces of solutions, A., 803, 992.  
   of condensable vapours by porous solids, A., 908.  
   of saturated vapours by porous substances, A., 331.  
   activated, A., 331, 568, 688.  
   quantum mechanics of, A., 992.  
   and solubility, A., 908.  
   activated and van der Waals, of gases, A., 118.  
   discontinuous, A., 568.  
   inner, in crystalline salts, A., 332, 991.  
   surface, in chain reactions, A., 344.  
 Adsorption apparatus, (P.), B., 372.  
 Aerogels, coherent expanded, A., 337.  
 Aeroplanes, coating compositions for, B., 314.  
 Aeroplane fabrics, surface protection of, B., 676.  
 Aerosols, properties of, A., 120.  
   theory of electrification of, A., 120, 335.  
   homogeneous, theory of coagulation of, A., 226.  
*Aesculus hippocastanum*, aesculin content of, A., 436.  
*Ætiomesobilirubin*, A., 627.  
   derivatives of, A., 1045.  
*Ætiophyllin*, A., 626.  
*Ætioporphyrin I*, and *di*- and *tetra*-chloro-, *mono*-, *di*-, and *tri*-nitro-, and *dinitro*-nitroso-, and their derivatives, A., 626.  
 Affinity, A., 239, 563, 988, 1078, 1191.  
   and migratory power, A., 363, 388, 389, 390, 391, 392, 393, 394, 395.  
 Affinity constants of substituted organic acids, A., 338.  
 Agar-agar, effect of swelling on X-ray spectrum of, A., 694.  
   gels, elastic deformation of, A., 806.  
   changes in volume and elastic modulus of, A., 995.  
   testing of, B., 439.  
   clarification of wines and fruit juices with, B., 1051.  
   as a constituent of pills, B., 321.  
   digestion of, by bacteria, A., 1289.  
 Agaric acid, attempted synthesis of, A., 499.  
*Agaricus campestris*. See Mushrooms.  
*Agathis labillardieri*, resins from, B., 436.  
 Agaves, saponins in leaves and juice of, A., 1179.  
   production of fibres from, (P.), B., 797.  
*Agave atrovirens*, composition of juice of, A., 662.  
*Agave lechuquilla*, composition of fibre and waste of, B., 976.  
 Agglomerating apparatus, grates for, (P.), B., 990.  
 Agglutination, A., 430.  
 Agglutinins, effect of hyperthermia, acidosis, and alkalosis on production of, A., 1054.  
 Aglucone, from *Linaria vulgaris*, A., 621.  
 from *Papaver rhæas*, A., 934.  
 Aglucones, position of lactone group in, A., 748.  
 Agmatine, biological degradation of, to carbamylputrescine, A., 545.  
 Agriculture, chemical analysis in, B., 618.  
*Agriolimax agrestis*. See Snails.  
*Agrostemma githago*, distribution of saponins in, A., 313.  
 Air, distribution of sulphur containing gases in, B., 841.  
   purification of, (P.), B., 242.  
   apparatus for, (P.), B., 630.  
   purification and filtration apparatus for, (P.), B., 50, 165.  
   cleaners for, (P.), B., 869.  
   for motors, compressors, etc., (P.), B., 869.  
   drying of, with silica gel, B., 1107.  
   drying apparatus for, (P.), B., 663.  
   filters for, (P.), B., 293, 325, 486, 630.  
   cleaning of, (P.), B., 486.  
   plate for, (P.), B., 869.  
   separator for, A., 925.  
   removal of dust from, (P.), B., 581, 756.  
   apparatus for, (P.), B., 407.  
   removal of hydrogen sulphide from, (P.), B., 466.  
   conditioning of, (P.), B., 455.  
   conditioning and sterilisation of, (P.), B., 754.  
   apparatus for measurement of pollution of, (P.), B., 754.  
   control of humidity of, (P.), B., 582, 869.  
   changes in, in occupied rooms, B., 914.  
   production of heat and cold with, (P.), B., 533.  
   furnace for heating of, (P.), B., 372.  
   apparatus for heating or cooling of, (P.), B., 87.  
   forced-draught heating in heaters for, B., 819.  
   compressors for, (P.), B., 789.  
   ionisation of, by  $\gamma$ -rays, A., 895.  
   mobility of ions in, A., 317.  
   recombination of ions in, A., 894.  
   saturation of, with vapours, A., 1199.

- Air, dispersion of, in aqueous solutions, A., 804.  
 Joule-Thomson effect in, A., 220.  
 flame temperatures of mixtures of methane, oxygen, hydrogen, acetylene, and, A., 127.  
 absorption of gases from, A., 16.  
 iodine in, A., 1106.  
 ozonised, determination in, of ozone, B., 383.  
 saturated, water content of, A., 339.  
 detection in, of ammonia, A., 1221.  
 of coal ash, B., 915.  
 detection and determination in, of carbon monoxide and dioxide, B., 504.  
 determination in, of vapours of amyl alcohol and amyl acetate, colorimetrically, A., 632.  
 of benzene, B., 536, 625.  
 of carbonaceous waste gases and soot, A., 925.  
 of dust, B., 531.  
 of hydrocarbons, A., 631.  
 of mercury, A., 490.  
 of sulphur compounds, A., 135.  
 of small amounts of sulphur dioxide, B., 914.  
 See also Atmosphere.
- Airships, fabrics for, (P.), B., 18, 224.
- Ajmalicine, and its salts, A., 203.
- Ajmaline, and its salts, A., 203.
- Ajmalinine, and its salts, A., 203.
- Alabamine, salts and acids of, A., 353.
- Alanine, isoelectric points of, A., 807.  
 aminolysis of, in presence of carbon, A., 836.  
 determination of, in protein, microchemically, A., 1050.
- $\beta$ -Alanine, additive compounds of, A., 150.
- dl*-Alanine polypeptides, A., 503.
- dl*-Alanine anhydride, A., 503.
- Alanine-*N*-phosphorons acid, and its barium salt, A., 937.
- Alanine-*N*-sulphonic acid, and its potassium salt, A., 1023.
- l*-Alanyl-*l*-alanine, A., 194.
- l*-Alanylbenzylamine, phenyl carbimide-derivative, A., 71.
- $\alpha$ -*dl*-Alanylalipalmatin, A., 364.
- $\alpha$ -*dl*-Alanylalidistearin, A., 364.
- d*-Alanyl-*d*-glucosamine hydrochloride, A., 935.
- dl*-Alanylglyceride, A., 364.
- dl*-Alanylglycine, 2-naphthalenesulphonyl derivative, A., 936.
- "Albertate 175A," as a matting agent for oil varnishes, B., 562.
- Albertols. See under Resins, synthetic.
- Albertus Magnus, A., 394.
- Albumin, production of, from vegetable materials, (P.), B., 127.  
 electrolyte binding in solutions of, A., 571.  
 sols, coagulation of, by alcohols, A., 1202.  
 separation of casein and, in milk, B., 159.
- egg-, combination of, with carbohydrates, A., 808.  
 digestion of, by pepsin, A., 193.
- serum, electro-osmosis and electrophoresis of, A., 1208.  
 combination curves, buffering power and equivalent of, A., 996.  
 osmotic pressure and mol. wt. of, A., 1271.  
 conversion of, into serum-globulin, A., 73, 636.  
 detection of, in urine, A., 958.  
 determination of, in blood-plasma, A., 183.
- Albuminous materials, production of physiologically active products from, (P.), B., 48.
- Albuminuria, A., 296.
- Alchemy, Chinese, A., 139.
- Alcohol. See Ethyl alcohol.
- Alcohols, formation of, by catalytic hydrogenation of esters, A., 599.  
 catalysts for, B., 300.  
 preparation of, by reduction of fats, A., 249, 1017.  
 manufacture of, (P.), B., 12.  
 from gaseous hydrocarbons, B., 972.  
 from olefines, (P.), B., 590, 716, 973, 1071.  
 separation of, from mixtures, (P.), B., 252.  
 from their solutions in hydrocarbons, (P.), B., 635.  
 from petroleum still residues, (P.), B., 590.
- Alcohols, recovery of, from alkyl sulphates, (P.), B., 540.  
 Raman effect in, A., 320.  
 absorption of radiation by, A., 470.  
 dipole moments of, A., 8.  
 pressure-temperature curves for, A., 1195.  
 electrocapillary curves of mixtures of water and, and their adsorption on mercury, A., 119.  
 diffusion of, A., 1081.  
 coagulation of casein and albumin sols by, A., 1202.  
 dehydration of, with alkali alkoxides, B., 831.  
 oxidation of, by chromic acid, A., 928.  
 catalytic oxidation of, A., 28, 1004.  
 photochemical oxidation of, by potassium dichromate, A., 1006.  
 condensation products of aldehydes and, (P.), B., 475.  
 reaction of, with chlorotriphenylmethane, A., 255.  
 with esters, in alkaline solution, A., 42.  
 with nitrosyl chloride, A., 496.  
 manufacture of alkali compounds of, (P.), B., 1020.  
 stoichiometric additive compounds of, with hydrogen chloride, A., 598.  
 characterisation of, by means of *p*-nitrophenylcarbimide, A., 597.  
 toxicity of, A., 964.  
 aliphatic, synthesis of, by catalytic reduction, A., 831.  
 manufacture of, from olefines, (P.), B., 670.  
 velocity of esterification of, by acetic acid, A., 1210.  
 toxicity of, A., 206.  
 higher, production of, (P.), B., 95, 172.  
 constants of, A., 1081.  
 aromatic, action of, on aromatic compounds, in presence of aluminium chloride, A., 611.  
 cyclic, manufacture of, (P.), B., 832.  
 secondary, oxidation of, by chromic acid, A., 380.  
 fatty, sulphonated, use of, in textile industry, B., 648.  
 halogenated, manufacture of, (P.), B., 763.  
 higher, isolation of, (P.), B., 540.  
 production of, (P.), B., 459.  
 by fermentation, (P.), B., 700.  
 from carbon monoxide and hydrogen, B., 300.  
 recovery of, from waxes, etc., (P.), B., 378.  
 reaction of, with *p*-nitrophenylcarbimide, A., 1232.
- Alcohols, higher, sulphonated, production of, (P.), B., 495.  
*polyhydric*, manufacture of, from aldoses, (P.), B., 13.  
 partial esterification of, A., 928.  
 acetalisation of, with mono- and diketones, A., 514.  
 precipitation of, by heavy metallic hydroxides, A., 368, 1020.  
 condensation products of polybasic acids and, (P.), B., 154, 272.  
 manufacture of derivatives of, (P.), B., 973.  
 production of rubber substitutes from, (P.), B., 671.  
 partly acetylated, ring-chain tautomerism of, A., 365.  
 hydroaromatic, manufacture of, (P.), B., 494.  
 lower, xanthate reaction with, A., 718.  
 primary, identification of, by means of dimethyldihydroresorcinol, A., 1235.  
 saturated, thermal conductivity of, A., 684.  
 primary and secondary, detection of, by nitro-chromic acid reaction, A., 718.  
 saturated, of high molecular weight, manufacture of, (P.), B., 56.  
 secondary, synthesis and crystal spacings of, A., 250.  
 ternary, freezing points of, A., 908.  
 unsaturated, primary, formation of, from  $\alpha$ -glycols, A., 1110.
- Alcoholic liquors, determination in, of esters, B., 159.  
 of fused oil and aldehydes, B., 282.
- Alcoholic products, removal of alcohol from, (P.), B., 620.
- Aldehydes, preparation of, from gaseous hydrocarbons, B., 972.  
 manufacture of, (P.), B., 793.  
 from olefine oxides, (P.), B., 12.  
 separation of, from their solutions in hydrocarbons, (P.), B., 635.  
 absorption spectra of, A., 272.  
 Raman effect in, A., 109.  
 isomerisation of, to ketones, A., 387.  
 oxidation of, by selenium dioxide, A., 833.  
 autooxidation of, A., 722.  
 anti-oxidants for, (P.), B., 460.  
 reduction of nitro-compounds by, A., 506.  
 condensation of, with 4:6-dinitro-*m*-xylene, A., 56.  
 with hydrazones, A., 159.  
 with methylene compounds, A., 514.  
 with phenols, A., 279.  
 with pyruvic acid, A., 720.  
 manufacture of condensation products of, (P.), B., 332.  
 condensation products of alcohols and, (P.), B., 475.  
 condensation products of amines and, (P.), B., 494.  
 reaction of, with diazomethane, A., 383.  
 with nitrosyl chloride, A., 496.  
 optical properties of dinitrophenylhydrazones of, A., 1109.  
 hydrogen sulphites of, A., 818.  
 aliphatic, production of, from lower paraffins and carbon dioxide, (P.), B., 469.  
 photolysis of, A., 1006.  
 polymerisation of, A., 367.  
 aromatic, synthesis of, A., 383.  
 condensation of, with  $\gamma$ -ketonic esters, A., 1031.  
 substituted, pyridine synthesis from, A., 744.  
 determination of, A., 867.  
 racemic, optical resolution of, A., 57.

Aldehydes, Schiff's reaction for, A., 742.  
 identification of, by means of dimethyl-dihydroresorcinol, A., 1235.  
 detection of, with ammoniacal fuchsin solution, A., 763.  
 with dimethylcyclohexanedione, B., 56.  
 determination of, in alcoholic liquids, B., 282.  
 in essential oils, B., 368, 960.

1-Aldehydeanthraquinone, and its substitution products, manufacture of, (P.), B., 764.

1-Aldehydeanthraquinone, 2-hydroxy-, A., 946.

3-Aldehydeanthraquinone, 1:8-dihydroxy-, A., 1252.

*m*-Aldehydobenzhydrol, and its phenylhydrazone, A., 50.

5-Aldehydocinnamic acid, 2-hydroxy-, silver salt and derivatives of, A., 946.

5-Aldehyde-3-cyano-2-methylpyrrole, and its derivatives, A., 1260.

2-Aldehyde-4:5-dimethoxyphenoxyacetic acid, derivatives of, A., 751.

2-Aldehyde-3:4-dimethylpyrrole-5-carboxylic acid, and its ethyl ester, A., 173.

Aldehydgalactose *pentaacetate*, hemiacetals of, A., 1021.  
 oxime, acetates of, A., 1237.

$\zeta$ -Aldehydeheptonic acid *p*-nitrophenylhydrazide *p*-nitrophenylhydrazone, A., 499.

Aldehyde-8-hydroxyquinolines, A., 946.

5-Aldehyde-4-methyl-2:3-diethylpyrrole, and its imine hydrochloride, A., 174.

$\beta$ -(2-Aldehyde-3-methyl-5-ethyl-4-pyrryl)-propionic acid, and its semicarbazone, A., 173.

3-Aldehyde-2-methylpyrrole-5-carboxylic acid, ethyl ester, oxime of, A., 1260.  
 derivatives of, A., 281.

6-Aldehydophenol-2-sulphonic acid, A., 946.

Aldehydophenylthiocarbimides, A., 154.

4-Aldehydophenylthiourethane, A., 154.

$\alpha$ -Aldehyde- $\Delta^6$ -propene- $\alpha\gamma$ -dicarboxylic acid, A., 499.

Aldehydosalicyclic acids, preparation of, A., 946.

Aldehyde-*d*-xylose *tetraacetate*, A., 146.

Aldehydease, A., 303.

Alder, cell membrane of, A., 662.

Aldol condensation, acceleration of, by amino-acids, A., 144.

Aldoses, electrolytic oxidation of, (P.), B., 364.  
 oxidation of, by bromine water, A., 834.  
 formation of  $\delta$ -lactones by, A., 1019.  
 methylation of monocarboxylic acids derived from, A., 1113.  
 action of moulds on, A., 145, 545, 1169.

Aldoximes, formation of, from dithiocarboxylic acids, A., 743.

Alduronic acid, detection of, A., 206.

*Alectorolophus*, destruction of, with kainite, B., 124.

*Aleurites montana*, Malayan, oil from, B., 270.

*Aleurocanthus woglumi*, concentration of hydrocyanic acid to kill, B., 813.

Algæ, conversion of, into bitumen and petroleum, B., 375.  
 gas content of, A., 1177.  
 control of, with copper sulphate, B., 753.  
 metabolism of, A., 1177.  
 green, influence of potassium cyanide and methylene blue on respiration of, A., 1177.  
 green, metabolic physiology of, A., 888.  
 marine, photosynthesis by, in diluted sea-water, A., 98.  
 treatment of, (P.), B., 227.

Algæ, marine, methylated nitrogen compounds in, A., 204.  
 nitrogen metabolism of, A., 101.  
 sugar alcohols in, A., 101, 1177.  
 fats of, A., 664.  
 higher, nitrate storage in, A., 314.  
 soil, nitrogen fixation by, B., 1128.

Alginase, A., 637.

Alginic acid, A., 721.  
 occurrence and constitution of, and its barium salt, A., 931.  
 and its compounds, manufacture of, (P.), B., 414.  
 salts, preparation of, in finely-divided form, (P.), B., 415.

Alimentary tract, of pigs, specificity of protein of mucous membrane of, A., 1274.

Aliphatic compounds, Friedel-Crafts synthesis of, A., 44, 514.  
 dimorphism of, A., 451.  
 higher, A., 468.  
 long-chain, alternation in, A., 326.

Alite, heat of formation of, A., 23.

Alizarin, adsorption of, by vacuum-sublimed films of alkaline-earth halides, A., 223.  
 reaction of, with sodium aluminate, A., 516.

Alizarin blue, preparation of, B., 14.

Alizarin dyes, mordant dyeing with, (P.), B., 19.

Alizarin pink, steaming of, without pressure, B., 143.

Alizarin red, printing of, on non-oiled fabrics, B., 640.

Alizarin glucoside, benzoylated, A., 603.

Alkali arsenites, A., 912.

azides, production of, (P.), B., 529.  
 borides, A., 579.  
 carbides, electrical conductivity of, A., 321.  
 chlorates, danger of explosion of, from mechanical shocks, A., 131.  
 chromates, manufacture of, (P.), B., 260.  
 dichromates, manufacture of, (P.), B., 885.  
 cyanamides, production of, (P.), B., 934.  
 cyanates, manufacture of, (P.), B., 21.  
 enolates, addition of, to esters, A., 614.  
 fluoborates and fluorosulphonates, A., 582.  
 fluorides, production of double compounds of aluminium fluoride and, (P.), B., 227.  
 aluminium fluorides, production of, (P.), B., 1119.  
 fluotitanates, A., 351.  
 halides, absorption spectra of coloured crystals of, A., 673.  
 spectra of vapour of, A., 1187.  
 infra-red spectra of, A., 675, 897.  
 dielectric constants of, A., 899.  
 grating energy of, A., 564.  
 effect of, on surface tension of ethyl alcohol-water mixtures, A., 1200.  
 solubility of, in acetone, A., 1197.  
 solid solutions between, A., 117.  
 vapour pressure of solutions of, A., 1083.  
 colouring in crystals of, A., 898.  
 coloured, absorption spectra of, A., 1074.  
 oceanic, lead and helium in, A., 358.  
 hydroxides, production of, from bicarbonates or carbonates, (P.), B., 1078.  
 removal of water from, (P.), B., 723.  
 conductivity of, in water, A., 1092.  
 hypochlorites, production of, (P.), B., 885.

Alkali iodochlorides, A., 1215.  
 ions, mobility of, in rare gases, A., 670.  
 slow, ionisation of inert gases by, A., 4.  
 metals, production of, electrolytically, (P.), B., 685, 943.  
 recovery of compounds of, from sulphate pulp "black liquor," (P.), B., 102.  
 bands due to polarisation molecules in spectra of, A., 891.  
 absorption spectra of, A., 1071.  
 selective absorption in thin layers of, A., 1071.  
 spectral sensitivity of thin films of, A., 208.  
 photo-electric properties of films of, A., 669, 1184.  
 electron diffraction and photo-electric effect of, A., 893.  
 electrochemical behaviour of, B., 432.  
 electrical conductivity of solutions of, in liquid ammonia, A., 1206.  
 mobility of ions of, in gases, A., 1185.  
 liquid, diffraction of X-rays by, A., 1192.  
 vaporisation of, (P.), B., 62.  
 action of, on graphite, A., 903.  
 introduction of, into gas-filled bulbs, (P.), B., 352.  
 double sulphates of rare earths and, A., 132.  
 detection of, A., 825.  
 determination of, after decomposition with hydrofluoric acid, A., 136.  
 spectroscopically, A., 1103.  
 determination and separation of, as perchlorates, A., 711.  
 separation of, from alkaline-earth metals with *isoamyl* alcohol, A., 488.  
 nitrates, manufacture of, (P.), B., 505, 724.  
 nitrites, fused, electrolysis of, A., 705.  
 determination of, in smokeless powders, B., 401.  
 phosphates, A., 582.  
 production of, (P.), B., 102, 261, 934.  
 from ferrophosphorus, (P.), B., 464.  
 salts, detergency of, B., 1118.  
 aluminosilicates, A., 350, 482.  
 aluminium silicates, treatment of, with nitric acid, (P.), B., 422.  
 sulphates, production of sulphur and, from alkali bisulphites, (P.), B., 980.  
 equilibria of, with water and sulphates of the vitriol type, A., 229, 1205.  
 hydrates of double sulphates containing, A., 125.  
 persulphates as analytical reagents, A., 1012.  
 sulphites, oxidation of, by cupric salt, in presence of pyridine, A., 1216.  
 and hydrogen sulphites, production of, from pulp digestion liquors, (P.), B., 885.

Alkalis, recovery of, B., 677.  
 from pulp liquor, B., 883.  
 Stark effect for, A., 891.  
 photo-ionisation of, on adsorption by negative salt surfaces, A., 105.  
 metals resistant to corrosion by, B., 387.  
 caustic, recovery of, from waste liquors, (P.), B., 464.  
 determination of, by electrodialysis, A., 1182.

Alkaline-earth azides, A., 131.  
 aluminates, production of, (P.), B., 1078.  
 bromides, compounds of, with carbamide, A., 997.  
 carbonates, heat-treatment of, (P.), B., 340.

Alkaline-earth carbonates, determination of, volumetrically, A., 489.  
 hydrogen carbonates, thermal decomposition of, in solution, A., 703.  
 chlorides, vapour pressure of water over, A., 339, 573.  
 cyanamides, manufacture of, (P.), B., 506.  
 hydrolysis of, A., 469.  
 halides, adsorption of alizarin by vacuum-sublimed films of, A., 223.  
 iodochlorides, A., 1215.  
 metals, production of, electrolytically, (P.), B., 685.  
 casting of, (P.), B., 990.  
 auto-ionisation in, A., 103.  
 vaporisation of, (P.), B., 62.  
 alloys of, with copper or iron, (P.), B., 310.  
 reaction of, with nitrogen, A., 1216.  
 determination of, spectroscopically, A., 1103.  
 separation and identification of, A., 1103.  
 separation of, from alkali metals by isoamyl alcohol, A., 488.  
 nitrates, mixed crystals of, A., 681.  
 oxides, separation of, from sesquioxides in soil analysis, B., 1046.  
 oxides and sulphides, grating energies of, A., 680.  
 sulphates, determination of radium in, A., 355.  
 Alkaloids, formation and biological significance of, A., 312.  
 production of, (P.), B., 400.  
 properties of, in relation to climate, A., 99.  
 ultra-violet absorption spectra of, A., 674.  
 adsorption of, by inorganic absorbents, A., 991.  
 emulsification of preparations of, at different  $p_H$  values, B., 447.  
 retention of, by oak sawdust, B., 1103.  
 production of additive compounds of, (P.), B., 1104.  
 production of alkyl ethers of, (P.), B., 207.  
 ferri- and ferro-cyanides of, A., 1147.  
 formation of, in plants, A., 975.  
 effect of, on nitrogen utilisation by germinating seeds, A., 1180.  
 precipitating agents for, A., 629.  
 palladous chloride as reagent for, A., 1052.  
 as reagents, A., 761, 763.  
 assay of drugs containing, B., 576.  
 detection of, microchemically, B., 1008.  
 determination of, A., 289.  
 by means of bromine, A., 72.  
 by simplified Fromme method, B., 206.  
 volumetrically, B., 863.  
 See also Aconite, Angostura, Calumba root, *Corydalis*, Ergot, Lobelia, Lupin, Salamander, Strychnos and Yohimba alkaloids.  
 "Alkanasul," from Chili, A., 595.  
 cycloAlkane-1-carboxylic acids, 1-hydroxy-, configuration of, A., 269.  
 Alkannin, constitution of, A., 396.  
 Alkoxides, alkali, addition of, to esters, A., 599.  
 Alkoxyacetic acids, and their esters, A., 832.  
 Alkoxy-acids, and their esters, odour and constitution of, A., 832, 1019.  
 $\alpha$ -Alkoxyalkyl chlorides, thermal decomposition of, A., 1132.  
 $\alpha$ -Alkoxyanilines, manufacture of derivatives of, (P.), B., 221.

Alkoxyanilines, chloro- and bromo-derivatives, manufacture of, (P.), B., 1114.  
 $\alpha$ -Alkoxybenzhydrylamines, and their local anesthetic powers, A., 52.  
 Alkoxy-carbazoles, amino- and nitro-, manufacture of, (P.), B., 878.  
 2-Alkoxy-naphthalenes, 1-amino-, manufacture of, (P.), B., 975.  
 Alkyl bromides, reduction of, by Grignard reagents, A., 837.  
 reaction of, with pyridine, A., 474.  
 $\alpha$ -chloroethyl ethers, preparation of, A., 41.  
 trichloromethyl carbonates, reaction of, with anhydrous sodium acetate, A., 143.  
 chlorides, production of, (P.), B., 56.  
 compounds of metals, manufacture of, (P.), B., 103.  
 hydroxy-, manufacture of, (P.), B., 12, 591.  
 ethers, sulphur, germicide activity of, A., 1291.  
 halides, manufacture of, (P.), B., 762, 878.  
 gaseous decomposition of, A., 1002.  
 photo-decomposition of, in non-polar solvents, A., 1007.  
 reaction of sodium vapour with, A., 830.  
 iodides, action of light on, A., 29, 706.  
 oxides, manufacture of, (P.), B., 1072.  
 peroxides, A., 831, 1114.  
 ozonides, A., 831.  
 radicals, free, A., 830.  
 sulphides, determination of, in benzene and naphtha solutions, A., 1017.  
 Alkylacetoacetic acids, ethyl esters, condensation of, with halogeno- and nitro-phenols and cresols, A., 519.  
 ethyl esters, condensation of, with  $\beta$ -naphthol, A., 1257.  
 Alkylaconitic acids, A., 602.  
 Alkylamines, use of, as solvents, B., 251.  
 higher, manufacture of, (P.), B., 671.  
 tert.-hydroxy-, manufacture of hydroxylated ethers of, (P.), B., 495.  
 $\beta$ -Alkylamino- $\alpha$ -hydroxyphenyl- $n$ -propyl alcohols, manufacture of, (P.), B., 591.  
 2-Alkylamino- $\beta$ -naphthathiazoles, A., 1046.  
 Alkylammonium picrates, conductivity of aqueous solutions of, A., 914.  
 Alkylanilines, rearrangement of, A., 1124.  
 4-Alkylguanacols, A., 266.  
 Alkylmalonic acids, X-ray structure of, A., 682.  
 condensation of esters of, with hydrazine, A., 1143.  
 Alkyl-naphthalenes, orientation in substitution reactions of, A., 941, 1122.  
 Alkyl-oxaldehydes, A., 384.  
 Alkylcyclopentanones, A., 740.  
 Alkylphenanthrenes, synthesis of, A., 608, 839, 1024.  
 $p$ -Alkylphenolsulphonic acids, A., 943.  
 Alkylphthalimides, reduction of, electrolytically, A., 739, 849.  
 Alkylpyridines, nitro- $\beta$ -hydroxy-, manufacture of, (P.), B., 251.  
 Alkylsulphonamido-groups, directive influence of, in benzene ring, A., 940.  
 Alkylsulphonium iodides, complex compounds of, with zinc and cadmium iodides, A., 364.  
 Alkylsulphuric acids, production of solid salts of, (P.), B., 173.  
 Alkylthiocarbamic acids, sodium salts, reaction of, with diazonium salts, A., 509.  
*Allanblackia Stuhlmanii*, seed fat of, B., 354.

Allantoin, origin of, in plants, A., 664.  
 in amniotic fluid and urine, A., 416.  
 determination of, colorimetrically, A., 283, 405.  
 in dog's urine, A., 84.  
 Allantoinase, A., 428.  
 Allantoxidine, reaction of, with alkali hydrogen sulphite, A., 625.  
 Allantoxanic acid, reaction of, with alkali hydrogen sulphite, A., 625.  
 Allene, and its homologues, Raman spectra of, A., 1189.  
 Allenic compounds, Raman effect in, A., 109.  
 Alligator oil. See Caiman fat.  
*Allium scorodoprasum*, carbohydrates in bulbs of, A., 1177.  
 Allotropy, crystal change during change due to, A., 986.  
 in liquids, A., 683, 799.  
 Alloxan, derivatives of, A., 951.  
 4:4-diphenylsemicarbazone and  $\alpha$ -naphthylhydrazone, A., 283.  
 6-oxime, and its phenylhydrazone, and 5:6-dioxime, A., 1041.  
 6-phenylhydrazone, A., 523.  
 phenylhydrazone- $p$ -sulphonic acids, sodium salts, A., 523.  
 fate of, in dogs, A., 84.  
 Alloxantin, fate of, in dogs, A., 84.  
 Alloys, manufacture of, (P.), B., 683, 803\*.  
 apparatus for study of, A., 925.  
 properties of, B., 1084.  
 transformations in, A., 1196.  
 X-ray investigation of structure of, B., 801.  
 X-ray study of phase boundaries of, A., 990.  
 inverse segregation in, B., 109.  
 case-hardening of, (P.), B., 311.  
 electric induction furnaces for heat-treatment of, B., 685.  
 change of distance between atoms in, due to lattice changes, A., 113.  
 Hall effect and grating constants of, A., 1082.  
 chemistry of, A., 220.  
 electro-deposition of, from cyanide solutions, A., 820.  
 electroplating of metals with, (P.), B., 68.  
 hydrogen overvoltage on, A., 472.  
 cathodic disintegration of, A., 237, 1096.  
 superconductivity of, A., 683.  
 thermal conductivity of, at high temperatures, A., 115.  
 reactivity of, in relation to fusion, A., 350.  
 fused, internal friction of, A., 117.  
 boiling points of, A., 219.  
 action of phosphoric acid on, B., 185.  
 containing carbides, production of, (P.), B., 803.  
 formed in mercury, A., 1082.  
 for tools, etc., (P.), B., 557.  
 of transition elements, crystal structure and atomic properties of, A., 15.  
 bearing metal, manufacture of, (P.), B., 231.  
 tool for treatment of, (P.), B., 232.  
 bronze, manufacture of, (P.), B., 350.  
 containing lead, (P.), B., 190, 191.  
 lead-base, arsenic in, B., 606.  
 high-lead, effect of cadmium on, B., 265.  
 tin- or lead-base, lubrication of, B., 348.  
 tin-base, effect of lead, nickel, bismuth, and zinc on, B., 1084.  
 white metal, B., 845.  
 containing zinc, (P.), B., 231.

Alloys, binary, constitution and magnetic moments of, A., 678.  
 magnetic susceptibility of, A., 686.  
 thermodynamic activities in, A., 573.  
 production of single crystals of, A., 454.  
 corrosion-resistant, (P.), B., 895.  
 electro-deposited, crystal structure of, A., 989.  
 ferrous and non-ferrous, corrosion of, B., 508.  
 hard, manufacture of, (P.), B., 311, 896.  
 for cutting tools, (P.), B., 896.  
 light, heat-treatment and forging of, B., 186.  
 electroplating of, with chromium, B., 511.  
 protection of, against corrosion, B., 387.  
 sand-cast, endurance of, B., 511.  
 wrought, influence of temperature on elasticity of, B., 510.  
 magnetic, A., 1196.  
 manufacture and refining of, (P.), B., 471.  
 mixed-crystal, electrical properties of, A., 1082.  
 non-ferrous, thermal conductivity of, B., 509.  
 action of sulphur on, B., 985.  
 precious metal, micro-analysis of, B., 150.  
 quantitative spectroscopic analysis of, A., 355.  
 spectrophotometer for analysis of, A., 1105.  
 volumetric and dilatometric analysis of, A., 15.  
 Allyl alcohol, electrolytic reduction potential of, A., 231.  
 density of, at low temperatures, A., 14.  
 Allyl bromide and iodide,  $\gamma$ -chloro-, preparation of, A., 362.  
 chloride, preparation of, from allyl alcohol and hydrochloric acid, A., 496.  
 cyanide, addition of cyclic amines to, A., 375.  
 radicals,  $\beta$ -substituted, abnormal decomposition of, A., 40.  
 Allyl acetic acid, action of peracetic acid on, A., 833.  
 5-Allylaminobarbituric acid, 5-bromo-, A., 283.  
 8-Allylamino-6-ethoxyquinoline hydrochloride, A., 522.  
 5-Allylamino-1-phenyltetrazole, A., 1044.  
 8-Allylaminoquinoline hydrochloride, A., 522.  
 5-Allylaminotetrazole, 1-amino-, A., 172.  
 N-Allylanabasine, and its salts, A., 758.  
 $\alpha$ -Allyl isobutyronitrile, A., 727.  
 2-Allylimino-3-dicarbomethoxy-4-ketotetrahydrothiophen, A., 758.  
 Allylmalonic acid, action of peracetic acid on, A., 833.  
 6-Allyl-3-methoxy-2:3-diketophenmorpholine, A., 1244.  
 Allyl-3-nitrophthalimide, A., 1231.  
 4-Allyloxy-2-methylquinoline, formation of 4-hydroxy-2-methyl-3-allylquinoline from, A., 862.  
 2-Allyloxyphenanthrene, A., 165.  
 9-Allyloxyretene, A., 165.  
 Allylphenanthrols, and their derivatives, A., 165.  
 5-Allyl-1-phenyl-3-methylbarbituric acid, A., 283.  
 2-Allyl-6-propylcyclohexanone, A., 162.  
 1-Allyltetrazole, 5-thiol-, A., 406.  
 Allylthiocarbimide, equilibrium of, with aniline and benzene, A., 913.

Allylthiocarbimide, action of halogens on dimethylmalonate additive product of, A., 758.  
 effect of, on sulphur metabolism in rabbits, A., 964.  
 Allyluracil-4(6)-carboxylic acids, and their ethyl ester, A., 66.  
 Allylxanthic acid, copper salt, A., 718.  
*Alnus glutinosa*. See Alder.  
 Aloes, evaluation of, B., 863.  
 colour reaction of, with nitric acid, B., 622.  
 Aloe-emodin, synthesis of, A., 1252.  
 Aloe-emodinanthranol, constitution of, A., 1252.  
 Aloin, A., 370.  
 Aloins, constitution of, A., 516, 1252.  
*Alstonia*, alkaloids in bark of species of, A., 1267.  
 Alumina. See Aluminium oxide.  
 Aluminium, nuclear factors for, A., 439.  
 atomic disintegration in, A., 980.  
 manufacture of, (P.), B., 389.  
 electrolytically, (P.), B., 610.  
 and its oxide, (P.), B., 724.  
 charging of electric furnaces for, (P.), B., 897.  
 recovery of, from scrap metal, (P.), B., 609.  
 refining of, (P.), B., 803.  
 refining grain size of, (P.), B., 1123.  
 electrolytic refining of, (P.), B., 513.  
 and its alloys, removal of gases from, (P.), B., 389.  
 removal of oxides, etc., from, (P.), B., 1087.  
 and its alloys, removal of oxides and gases from, (P.), B., 990.  
 detinning of, (P.), B., 1087.  
 treatment of, during cooling, (P.), B., 389.  
 with nitrogen, (P.), B., 111.  
 treatment of surfaces of, (P.), B., 990.  
 and its alloys, obtaining good contact between, (P.), B., 232.  
 casting of, (P.), B., 389.  
 non-porous castings of, (P.), B., 989.  
 preferred orientation produced by cold-rolling in sheets of, B., 186.  
 effect of cold-working on, B., 150.  
 heat-treatment of, (P.), B., 1087.  
 open-flame furnaces for melting of, (P.), B., 266.  
 soldering of, B., 310.  
 alloy for, (P.), B., 1123.  
 flux for, (P.), B., 685.  
 and its alloys, solder for, (P.), B., 351.  
 welding of, B., 348.  
 with carbon electrodes, B., 348.  
 and its alloys, B., 310.  
 and its alloys, autogenous welding of, B., 606.  
 relation between mechanical properties of copper, silver, and, B., 265.  
 and its alloys, influence of iron and silicon on, B., 774.  
 influence of, on brass alloys, A., 686.  
 spectrum of, A., 207, 892.  
 arc spectrum of, A., 552.  
 ultra-violet spectrum of, A., 891.  
 H-rays from, A., 1186.  
 scattering of X-rays by, A., 11.  
 artificial disintegration of, by  $\alpha$ -particles, A., 318.  
 penetration of  $\alpha$ -particles into, A., 671.  
 cathodic sputtering of, in helium, A., 981.  
 electrochemistry of, A., 1207.  
 electrometallurgy of, B., 802.  
 and its alloys, electrodeposition of, B., 470.

Aluminium, crystallographic relation of, to gallium, germanium, and silicon, A., 681.  
 recrystallisation of, and its hardenable copper alloys, A., 989.  
 crystals, structure of, A., 796, 1192.  
 corrosion of crystals of, under stress, A., 452.  
 films, photo-electric properties of, A., 789.  
 velocity of solution of, in solutions of ferric salts, A., 817.  
 solubility of, in magnesium in the solid state, B., 429.  
 explosion temperature of, A., 667.  
 explosion regions of mixtures of, with calcium fluoride, molybdenum oxides, boron trioxide, and sulphur, A., 917.  
 corrosion of, B., 644.  
 and its alloys, corrosion-resistant coating of, (P.), B., 609.  
 coating of, electrically, (P.), B., 991.  
 plating of, with nickel, B., 430.  
 with zinc, (P.), B., 351.  
 and its alloys, production of dielectric coatings on, (P.), B., 111.  
 production of oxide coatings on, A., 450; B., 310, 430; (P.), B., 803.  
 coating of iron or steel articles with, (P.), B., 231.  
 anodic layers on, A., 347; B., 348.  
 formation and colouring of films of hydroxide on articles of, (P.), B., 68.  
 and its alloys, action of hydrogen peroxide on, B., 1036.  
 interaction of water vapour and, B., 429.  
 co-ordination number of, in aluminosilicates, A., 11.  
 properties of apparatus made of, B., 185.  
 production of friction-resisting surfaces from, (P.), B., 455.  
 type matrices from, (P.), B., 557.  
 use of, for liquid fuel containers, B., 843.  
 oil proofing of vessels of, (P.), B., 989.  
 occurrence and determination of, in foods, B., 702.  
 biochemistry of, A., 879.  
 in plants, A., 549.  
 physiological action of, A., 1060.  
 cast, plating of, B., 1083.  
 Aluminium alloys, (P.), B., 989.  
 removal of gases from, B., 941.  
 refining grain size of, (P.), B., 1123.  
 hardening of, (P.), B., 557.  
 age-hardening of, B., 510.  
 corrosion of, B., 553.  
 effect of anodic treatment on abrasion and corrosion of, B., 553.  
 surface coatings for, B., 187.  
 oxide films as bases for coating of, B., 1122.  
 effect of antimony on, B., 844.  
 corrosion-resistant, B., 186; (P.), B., 189, 609.  
 resistant to alkalis, (P.), B., 1037.  
 resistant to sea water, (P.), B., 311.  
 treatment of, (P.), B., 472.  
 light, ageing of, B., 109, 1122.  
 for casting, B., 1083.  
 for coinage, B., 941.  
 determination in, of hydrochloric acid-soluble aluminium, B., 844.  
 Aluminium alloys with antimony; A., 1082.  
 with antimony and bismuth, (P.), B., 351.  
 with bismuth, with cadmium, and with lead, A., 685.  
 with chromium and iron, heat-resistant, (P.), B., 847.  
 with cobalt, A., 685.

- Aluminium alloys with copper, B., 605, 684.  
 cast, physical properties, thermal analysis and micro-structure of, A., 15.  
 with copper and iron, A., 907.  
 with copper and magnesium, A., 989.  
 with copper, magnesium, and silicon, A., 685.  
 with copper and silicon, A., 907.  
 with copper and zinc, (P.), B., 847.  
 with iron, production of, (P.), B., 555.  
 lattice structure of, A., 567, 685.  
 resistance of, to oxidation, B., 680.  
 with lead and magnesium, (P.), B., 389.  
 M.G.7, B., 310.  
 with magnesium, degassing of, (P.), B., 1123.  
 corrosion-resistant, (P.), B., 990.  
 with magnesium and silicon, A., 907.  
 with manganese, A., 116.  
 production of, by electrolysis, A., 478.  
 controlling grain growth in, (P.), B., 1123.  
 with manganese and silicon, (P.), B., 685.  
 with manganese and zirconium, (P.), B., 685.  
 with nickel and tin, A., 567.  
 with silicon, B., 309; (P.), B., 111, 112, 389, 472.  
 treatment of, (P.), B., 775.  
 for pistons, (P.), B., 609, 684.  
 with silver, (P.), B., 896.  
 with tin and zinc, (P.), B., 311.  
 with zinc, A., 799; B., 681.
- Aluminium compounds, production of, from beryl, (P.), B., 547.  
 with lanthanum, heat of formation of, A., 575.  
 biology of, A., 1285.  
 assimilation of, by the human system, A., 192.
- Aluminium salts, titration of, with alkalis, A., 471.  
 determination in, of aluminium and excess acid, B., 677.
- Aluminium bromide, anhydrous, preparation of, A., 239.  
 compounds of, with pyridine, A., 468.  
 bromide or chloride, action of, on aliphatic alcohols and acetone, A., 583.  
 chloride, manufacture of, (P.), B., 383, 770.  
 production of, from ash of Moscow coal, B., 1028.  
 anhydrous, manufacture of, (P.), B., 506.  
 recovery of, from refining of mineral oils, (P.), B., 886.  
 separation of iron from solutions of, B., 598.  
 complexity of, A., 453, 684.  
 catalytic action of, A., 49, 744.  
 reactions catalysed by, A., 1132.  
 compound of hydrogen cyanide and, A., 132.  
 effect of, on respiration of kidneys, A., 89.  
 basic, analysis of solutions of, A., 822.  
 fluoride, fusion curves of, with lithium and potassium fluorides, A., 810.  
 alkali fluorides, production of, (P.), B., 227, 724, 1119.  
 germanates, A., 1099.  
 halides, dipole moments of, and their molecular compounds, A., 447.  
 heat of formation of, A., 998.  
 densities of, A., 1190.  
 vapour density and pressure of, A., 565.
- Aluminium hydride, pressure effect in dissociation of, A., 791.  
 hydroxide, dehydration of, A., 680.  
 separation of, from silicic acid, (P.), B., 599.  
 colloid chemistry of, A., 471.  
 sols, properties of, A., 121.  
 decomposition pressure of, A., 573.  
 precipitation of, in easily filtered form, A., 244.  
 nitride, production of, (P.), B., 22.  
 heat of formation of, A., 470.  
 oxide (*alumina*), production of, (P.), B., 261, 465, 599, 1078.  
 from its nitrate, (P.), B., 422.  
 from calcium aluminates, (P.), B., 227.  
 from wyomingite, B., 884.  
 and phosphorus, (P.), B., 22.  
 extraction and refining of, (P.), B., 799.  
 recovery of, from boiler ash, (P.), B., 471.  
 from coal products, (P.), B., 506.  
 electrokinetic potential of diaphragms of, A., 1208.  
 dielectric constant of buffer layers of, A., 214.  
 specific heat of, at high temperatures, A., 328.  
 fusion diagram of, A., 913.  
 dispersion of, by acids, A., 693.  
 hydrosols, A., 462.  
 sols, aged, stabilisation of, by basic aluminium chloride, A., 693.  
 equilibrium of, with calcium and sodium oxides, A., 574.  
 with carbon, A., 341.  
 with silicon and zinc oxides, A., 574.  
 chlorination of, A., 1099.  
 reaction of, with barium sulphate, A., 482.  
 manufacture of refractory articles from, (P.), B., 679.  
 amorphous, Blanc's, A., 129.  
 crystalline, in silicate melts, A., 904.  
 determination of, in clays, B., 466.  
 in refractory materials, B., 147.
- $\gamma$ -Aluminium oxide, lattice constants of, A., 1079.
- Aluminium phosphates, treatment of, (P.), B., 678.  
 iron phosphates, in Brazilian laterite, A., 1229.  
 silicates, colloidal, ionic exchange in, A., 992.  
 analysis of, A., 588; B., 679.  
 alkali silicates, A., 120.  
 treatment of, with nitric acid, (P.), B., 422.  
 potassium silicates, volatilisation of potash from, B., 339.  
 sulphate, manufacture of, from clay of the Polevski district, B., 101.  
 equilibrium of sodium sulphate, water, and, A., 341.  
 sulphate, analysis of, A., 490.  
 sodium sulphate, A., 997.
- Aluminium detection, determination, and separation:—  
 detection of, by formation of caesium alum, A., 490.  
 microchemically, A., 590.  
 determination of, A., 356.  
 by cyanate method, and its separation from manganese and zinc, A., 136.  
 volumetrically, A., 356, 826.  
 in presence of iron, A., 1103.  
 in its compounds, A., 243; B., 677.  
 in foods, B., 969.  
 in soils with 8-hydroxyquinoline, B., 1129.
- Aluminium detection, determination, and separation:—  
 determination in, of copper, B., 1083.  
 of iron, B., 802.  
 of oxide, B., 606.  
 of silicon, B., 844.  
 of sodium, B., 844, 892.  
 of titanium, silicon, and iron, spectroscopically, A., 35.  
 separation of, from calcium, A., 1223.  
 from iron, A., 1011.  
 from zinc, A., 489, 1223.
- Aluminium bronze, for coinage, B., 941.
- Aluminium foil, effect of heat on properties of, B., 310.  
 perforated, use of, for prevention of corrosion, (P.), B., 111.
- Aluminium powder, production of, (P.), B., 803.  
 use of, in paints, B., 947.  
 compounding of rubber with, B., 1092.
- Aluminium sheets, for protection of archival documents against fire, (P.), B., 431.
- Aluminium vessels, properties of, B., 185.  
 disinfectants and cleaning agents for, (P.), B., 322.
- Aluminium wire, crystal structure of, A., 796.  
 large grain size in, B., 606.  
 "Aluminon," reactions of, with metals, A., 587.
- Aluminosilicates, A., 482.  
 artificial, thermal analysis of, A., 469.
- Alunite, formation of, in Polish Mittelgebirge, A., 829.  
 treatment of, (P.), B., 146.  
 thermal decomposition of, A., 30; B., 463.
- Alupag wood, Philippine, composition of, B., 773.
- Amalgams. See Mercury alloys.
- Amalgamation, apparatus for, (P.), B., 189.
- Amanita phalloides*, poisons of, A., 785.
- Amarine, chemiluminescence of, A., 676.
- Amaranth, determination of, in dyes, B., 139.
- Amber, electrical conductivity of, A., 899.
- Amides, manufacture of, (P.), B., 928, 975.  
 saponification of, A., 344.  
 reaction of, with aniline, A., 732.  
 substituted, manufacture of, (P.), B., 591.  
 formation of ketens from, A., 849.  
 determination of, in presence of carbohydrates, A., 666.
- Amidines of pharmacological interest, A., 55.
- Amines, preparation of, by means of azoimide, A., 1030.  
 production of, catalytically, (P.), B., 94.  
 purification of, A., 376.  
 refractive indices of mixtures of, with acetic acid, A., 1197.  
 ultra-violet absorption spectra of, A., 674.  
 ultra-violet absorption spectra and velocity of reaction of, A., 444.  
 photochemical reaction of, with carbon monoxide, A., 349.  
 effect of, on viscosity of collodion in ether-alcohol, A., 1202.  
 equilibria of, in binary systems with acetic acid, A., 1204.  
 chemical reactivity of, A., 371.  
 catalysis of alkylation of, by nickel, A., 236.  
 production of condensation products of aldehydes and, (P.), B., 494.



- Amines**, reaction of, with arylsulphonyl chlorides, A., 52.  
 with dibromobarbituric acid, A., 523.  
 on dicyanodiamidine, A., 504.  
 with esters of unsaturated acids, A., 1246.  
 on mercurous chloride, A., 1217.  
 on sulphur, A., 943.  
 compounds of, with ferric inositol-phosphate, A., 1127.  
 ternary compounds of, with sulphur dioxide, A., 375.  
 effect of sympathicolytic poisons on pressor action of, A., 647.  
 aliphatic, manufacture of, (P.), B., 792.  
 aromatic, production of, (P.), B., 56, 878.  
 from phenols, (P.), B., 591.  
 and their salts, capillary properties of, A., 569.  
 methylation of, (P.), B., 138.  
 sulphonation of, (P.), B., 13, 1020.  
 manufacture of acyl derivatives of, (P.), B., 459.  
 primary, reactions of benzoin and chlorobenzoin with, A., 396.  
 identification of, by formation of *p*-toluenesulphonates, A., 375.  
 determination of, by means of picryl chloride, A., 1149.  
 cyclic, primary, detection of, colorimetrically, in medicaments, B., 972.  
 pharmacologically active, synthesis of, A., 54, 843, 1126.  
 primary, reaction of, with acetalythiocarbimide, A., 864.  
 detection of, A., 1149.  
 racemic, resolution of, at low temperatures, A., 1238.  
 saturated, manufacture of, (P.), B., 496.  
 identification of, by formation of *p*-nitrobenzyl derivatives, A., 502.  
 determination of, in foods, B., 701.  
**Amino-acids**, A., 400, 637, 949, 1144.  
 refractivity of solutions of, A., 804.  
 absorption spectra of, A., 896.  
 ultra-violet absorption spectra of, A., 674.  
 rotation and  $p_H$  of, A., 324.  
 racemisation of, by acetic anhydride, A., 1238.  
 apparent dissociation constants of, A., 227.  
 solubilities of, A., 1084.  
 mutual effect of, in solution, A., 18.  
 catalytic deamination of, A., 1286.  
 oxidation of, by dialuric acid, A., 404.  
 sulphonation of, A., 1022.  
 colour reaction of, with alloxan, A., 410.  
 action of, with formaldehyde, A., 48.  
 on sugars, A., 605, 1239.  
 complex compounds of, with neutral salts, A., 573.  
 molecular compounds of, A., 149.  
 esters, with glycerol and fatty acids, A., 364.  
 glucosides, synthesis of, A., 605.  
 synthesis of peptide-like substances from, A., 837.  
 synthesis of derivatives of, A., 936.  
 synthesis of phosphorus derivatives of, A., 937.  
 synthesis of, by animal tissues and bacteria, A., 1066.  
 purified, feeding experiments with, A., 83.  
 of tissues, A., 637.  
 influence of, on tissue respiration, A., 82, 420, 643.  
 effect of administration of, on urine, A., 538.  
 active, synthesis of derivatives of, A., 726.
- Amino-acids**, fluorinated, and their derivatives, A., 1130, 1247.  
 non-essential, use of, in covering the endogenous nitrogen loss, A., 189.  
 tervalent, peptides of, A., 71, 468.  
 interference of reducing sugars in ninhydrin reaction for, A., 257.  
 determination of, in blood-serum, A., 183.  
 $\gamma$ -Amino-acids, action of nitrosyl bromide on, A., 158.  
 $\omega$ -Amino-acids, behaviour of, in the body, A., 771.  
**Amino-alcohols**, A., 157, 611.  
 formation of, from mixed benzoin, A., 746.  
 deamination of, A., 391.  
 aliphatic, preparation of, A., 1118.  
 aromatic, manufacture of, (P.), B., 496.  
 $\beta$ -Amino-aldehydes, *N*-substituted, synthesis of, A., 503.  
**Amino-compounds**, cataphoresis of, A., 21.  
 aromatic, action of sulphites on, A., 264.  
 characterisation of, by means of *p*-nitrophenylcarbimide, A., 597.  
**Amino-groups**, determination of, by van Slyke's method, A., 314.  
**Aminohydroxy-acids**, apparent dissociation constants of, A., 227.  
**Aminohydroxy-compounds**, biuret reaction with, A., 1118.  
**Amino-ketones**, A., 157.  
**Amino-nitriles**, configuration of, A., 606.  
 catalytic hydrogenation of, A., 727.  
 action of Grignard reagents on, A., 1239.  
**Aminopolypeptidase**, A., 543.  
**Aminopyrine**. See **Pyramidone**.  
**Amino-sugars**, synthesis of peptide-like substances from, A., 837.  
**Ammines**, A., 484, 585.  
 formation of, in aqueous solution, A., 1098.  
**Ammonia**, molecular structure of, A., 982.  
 synthesis of, B., 179, 799.  
 apparatus for, B., 769, 770.  
 catalysts for, (P.), B., 21, 1119.  
 iron catalysts for, A., 1004.  
 gas generators for gases for, (P.), B., 248.  
 purification of gases for, (P.), B., 678.  
 by-products from, B., 770.  
 use of coal in plant for, at Billingham, B., 1062.  
 synthesis and decomposition of, by  $\alpha$ -rays, A., 1214.  
 formation of hydrazine in synthesis and decomposition of, A., 581.  
 production of, (P.), B., 420, 677, 934.  
 catalytically, (P.), B., 505.  
 from ammoniacal liquors, (P.), B., 1028.  
 from coke-oven gas or town gas, B., 329.  
 from atmospheric nitrogen, (P.), B., 841.  
 from salt and coal, (P.), B., 934.  
 from water hyacinth, B., 134.  
 recovery of, (P.), B., 884.  
 from coal distillation, B., 632.  
 from fuel gas, B., 1015.  
 from nitrogenous waste materials, (P.), B., 464.  
 apparatus for purification of concentrated aqueous solutions of, B., 100.  
 separation of, from gases, (P.), B., 884.  
 absorption band spectrum of, A., 558.  
 Raman spectrum of, A., 108, 897.  
 Raman effect and structure of, A., 320.  
 rotation-vibration spectrum of, A., 674.
- Ammonia**, liquid, low-pressure synthesis of, B., 1027.  
 electrical conductivity of solutions of alkali metals in, A., 1206.  
 solubility of helium and hydrogen in, A., 1197.  
 solubility of inorganic salts in, A., 1197.  
 density of solutions of sodium, potassium, and sodium bromide in, A., 1200.  
 vapour pressure and entropy of, A., 566.  
 effect of, on viscosity of colloid in ether-alcohol, A., 1202.  
 activated and van der Waals adsorption of, A., 118.  
 adsorption of, by glass, A., 331.  
 absorbent for gas masks for protection against, (P.), B., 210.  
 graphical determination of solubility of, in water, B., 20.  
 solubility of, in aqueous sodium hydroxide, A., 457.  
 theory of distillation of solutions of, B., 100.  
 equilibrium of, with carbamide and carbon dioxide, A., 23.  
 with carbon dioxide and water, A., 229.  
 with inorganic salts, organic liquids and water, A., 1197.  
 phase study of mixtures of, with hydrogen sulphide, A., 340.  
 flame temperatures of, mixed with its dissociation products, A., 808.  
 decomposition of, (P.), B., 181.  
 velocity of decomposition of, on iron, A., 1095.  
 catalytic decomposition of, on tungsten, A., 704.  
 catalytic decomposition and oxidation of, A., 477.  
 photochemical decomposition of, A., 705.  
 thermal decomposition of, A., 324.  
 on osmium, A., 347.  
 oxidation of, B., 61.  
 apparatus for, (P.), B., 464.  
 catalysts for, (P.), B., 980.  
 lime and stannic oxide as catalysts for, B., 381.  
 catalytic oxidation of, (P.), B., 505.  
 burner for, (P.), B., 723.  
 photochemical oxidation of aqueous solutions of, A., 1006.  
 photochemical reaction of, with carbon monoxide, A., 349.  
 action of, on mercurous chloride, A., 1217.  
 with active nitrogen, A., 820.  
 compound of, with ferric inositolphosphate, A., 1127.  
 removal of, from gases, (P.), B., 248, 329, 377, 922.  
 use of oxidation plant for, for manufacture of sulphuric acid, (P.), B., 21.  
 fertilising effect of solutions of, B., 567.  
 formation of, in blood, A., 1272.  
 in brain, A., 1059.  
 in hearts, A., 771.  
 in the kidneys, A., 638.  
 post-mortal, in muscle, A., 422.  
 in the organism, A., 84.  
 source of, in urine, A., 295, 1056.  
 anhydrous, B., 677.  
 detection of, microchemically, in presence of pyridine, A., 1221.  
 in air, A., 1221.  
 determination of, without distillation, A., 587.  
 standards for, colorimetrically, A., 921.  
 in Kjeldahl determinations, A., 354.  
 volumetrically, A., 710.  
 in blood, A., 957.  
 in foods, B., 701.

- Ammonia**, determination of, in frog's muscle, A., 78.  
in tobacco in presence of nicotine, B., 703.
- Ammoniacal liquors**, disposal of, B., 1016.  
distillation of, (P.), B., 934.  
irrigation with, mixed with town sewage, B., 74.  
containing tar acids, treatment of, (P.), B., 1067.  
determination in, of tar, B., 872.
- Ammoniates**, valency fields of, A., 901.  
thermal properties of, and their use in refrigerators, B., 840.
- Ammonium compounds**, quaternary, degradation of, A., 854.  
thio-, pharmacology of, A., 540.
- Ammonium salts**, production of, (P.), B., 260.  
from salt and coal, (P.), B., 934.  
recovery of, from waste liquors from coal carbonisation plant, (P.), B., 587.  
specific heat of, A., 453, 1081.  
f.p. of solutions of, A., 912.  
production of crystals of, from acid saturators, (P.), B., 599.  
abnormal, A., 679.  
alkylated, preparation and properties of, A., 685.  
determination of, with formaldehyde, A., 135.
- Ammonium hexabromoselenate**, crystal structure of, A., 903.  
carbonate and hydrogen carbonate, manufacture of, (P.), B., 934.  
hydrogen carbonate, recovery of, from ammoniacal liquors, (P.), B., 102.  
replacement of food protein by, in feeding of cows, A., 421.  
chloride (*sal ammoniac*), manufacture of, (P.), B., 340, 677, 678.  
from gasworks liquor, (P.), B., 770.  
and sodium carbonate, (P.), B., 181.  
purification of liquors containing, (P.), B., 547.  
elimination of liquid contact potentials with, A., 343.  
production of crystals of, (P.), B., 980.  
crystallisation of, with cadmium chloride, A., 1198.  
influence of pectin on crystal growth of, B., 304.  
equilibria of, with heavy metal chlorides, A., 469.  
separation of cuprous chloride and, (P.), B., 465.  
influence of, on mineral metabolism in rickets, A., 1159.  
chloride and nitrate, boiling point of mixtures of, with potassium chloride and nitrate, A., 222.  
chromate and sulphate, solubility of mixed crystals of, A., 1084.  
halides, vapour pressures and dissociation of, A., 1204.  
nitrate, manufacture of, (P.), B., 305, 421, 547.  
effect of temperature on crystal structure of, A., 986.  
rhombic, crystal structure of, A., 903.  
equilibrium of, with potassium nitrate and water, A., 810.  
decomposition of, A., 483.  
mixing of phosphates and, B., 101.  
assimilation of, by plants, A., 99.  
permutites, A., 120.  
phosphate, production of cement and, from calcined phosphate, (P.), B., 1078.  
hydrogen phosphate, manufacture of, (P.), B., 464, 885.  
from impure phosphoric acid, (P.), B., 980.
- Ammonium sulphate**, production of, (P.), B., 102, 146, 463.  
from Glauber's salt at Karabugaz, B., 100.  
from gypsum, B., 101.  
and sodium carbonate, B., 100.  
recovery of, from ammoniacal gases, B., 100.  
crystals, production of, (P.), B., 102.  
hygroscopicity of, B., 1028.  
equilibrium of, with thallium sulphate and water, A., 1091.  
coarse-grained, manufacture of, (P.), B., 340.  
fixation, nitrification, and leaching of, in soils, B., 617.  
determination in, of free sulphuric acid, B., 840.  
sulphate nitrate, production of, (P.), B., 145.  
composition for stabilisation of, (P.), B., 724.  
persulphate, as a depolariser for primary batteries, B., 775.  
sulphide, reaction of, with formaldehyde, A., 932.  
sulphite, oxidation of, in aqueous solution, (P.), B., 934.  
thiosulphate, B., 179.  
conversion of, into sulphate and mixed fertilisers, B., 180.
- Ammonium organic compounds**, quaternary, degradation of, A., 48, 149, 262, 816, 1242.  
substitution of hydrogen by aldehydic residues in, A., 48.  
curariform action of, A., 192.
- Ammono-aldehydes**, aliphatic, A., 503.
- Ammunition**, (P.), B., 81.
- Amniotic fluid**, allantoin in, A., 416.
- Amoeba**, physiology of movement of, A., 652.
- Amphiboles**, A., 38.  
alkali, A., 38.  
monoclinic, A., 493.
- Amphibolite**, titaniferous, from Riboira, Galicia, A., 926.
- Ampoules**, evacuated, testing vacuum of, (P.), B., 756.
- Amputation**, influence of, on blood constituents, A., 1162.
- Amyl alcohol**, dipole moment of, A., 677.  
manufacture of substitute for, (P.), B., 332.  
determination of, in air, colorimetrically, A., 632.  
*iso*-Amyl alcohol, heat of mixing of, with ethyl alcohol and water, A., 1091.  
equilibrium of, with methyl alcohol and water, A., 801.  
*d*-Amyl alcohol, synthesis of, A., 142.  
*r*-Amyl alcohol, attempted resolution of, A., 142.
- Amyl bromomethyl ether**, A., 250.  
 $\alpha$ -chloroethyl ether, A., 41.  
nitrite, analysis of, B., 331.  
phosphates, preparation and enzymic hydrolysis of, A., 1167.  
*iso*-Amyl *N*-diphenyl- and *N*-*p*-nitrophenylurethanes, A., 1239.  
ether, pure, preparation of, A., 1110.  
*n*- and *iso*-Amyl ethers, fluidities of, A., 566.  
*n*- and *iso*-Amyl radicals, affinity capacities of, A., 363.  
*iso*-Amyl series, optical rotation of hydrocarbons of, A., 360.
- Amylase**, activation of, A., 427.  
activity of, A., 1165; B., 573.  
effect of guanidine and its derivatives on action of, A., 881.
- Amylase**, hydrolysis of starch by, A., 881, 1063.  
Cumbu, hydrolysis of starch by, A., 91.  
of leucocytes, A., 292.  
malt, hydrolysis of starch by, A., 881.  
pancreatic, chemical nature of, A., 303.  
of plants, A., 1286.  
potato, A., 775.  
effect of chemicals on activity of, A., 661.  
salivary, effect of chlorides on, A., 427.  
in seeds, A., 303.  
of sugar-beet leaves, A., 775.  
vegetable, diastatic action of, A., 303.
- Amylases**, specificity of, A., 1062.
- $\alpha$ - and  $\beta$ -Amylases, separation and action of, A., 91.  
in barley and malt, A., 649.
- 4-Amylaminophenylarsinic acids**, 3-amino- and 3-nitro-, A., 1049.
- iso*-Amylaniline**, derivatives of, and its rearrangement to *p*-amino-*tert*-amylbenzene, A., 1124.
- $\eta$ -Amylbenzene**, 3:5-dihydroxy-, A., 521.
- tert*-Amylbenzene**, *p*-amino-, derivatives of, and its formation from *iso*-amyl-aniline, A., 1124.
- 4-Amylbenzoic acid**, 2:6-dihydroxy-, A., 521.
- 6-Amylbenzoic acid**, 2:4-dihydroxy-. See Olivetolcarboxylic acid.
- 3-*iso*-Amylbenzoic acid**, 2:4-dihydroxy-. See Tetrahydrotubacinic acid.
- trans*- $\alpha$ -*n*-Amylcinnamic acid**, and its dibromide, A., 268.
- Amylene**, effect of dark electric discharge on, A., 1016.  
 $\beta$ -*dl*-Amyl-*d*-glucoside, A., 142.
- Amylharmlol**, pharmacology of, A., 647.
- Amylideneamylamine dibromide**, A., 742.
- iso*-Amylidenebenzylamine**, A., 253.
- iso*-Amyl-3-nitrophthalimide**, A., 1231.
- Amylokinase** in germinating barley, A., 304.
- Amylopectin**, molecular structure of, A., 1116.  
formation of, from starch, A., 370.  
combination of, with proteins, A., 501.
- Amylose**, molecular structure of, A., 370, 1116.  
 $\alpha$ -Amylose, modifications of, A., 604.  
Amylosynthase, A., 967.
- n*-Amyloxymethyl methyl and ethyl ethers**, A., 1233.
- p*-Amylphenol-2-sulphonic acid**, salts of, A., 943.
- 2-*n*-Amylquinoline**, synthesis of, under physiological conditions, A., 1046.
- 2-*n*-Amylquinoline-3-carboxylic acid**, A., 1046.
- 2-*iso*-Amylresorcinol**. See Tetrahydrotubanol.
- $\beta$ -Amylstyrene**,  $\beta$ -bromo-, A., 269.
- $\alpha$ -*n*-Amylstyryl methyl ketone**, and its oxime, A., 268.
- dl*-Amyl- $\beta$ -*d*-tetra-acetylglucoside**, A., 142.
- 2-*iso*-Amyl-1:3:5-triazine**, and its salts and acetyl derivatives, A., 756.
- Amylum sols**, effect of electrolytes on, A., 1087.
- Amylvinylcarbinol**, resolution of, A., 144.
- Amyranene**, A., 1245.
- $\beta$ -Amyrilene dioxide**, A., 1254.
- Amyrilenes**, derivatives of, A., 517, 856.
- $\alpha$ -Amyrin benzoate**, dehydrogenation of, A., 1245.
- $\beta$ -Amyrin monoxide**, A., 517.
- Amyrins**, A., 1253.  
determination of double linkings in, A., 517.  
dehydrogenation products of, A., 1253.

- Amyrin series, oxidation and dehydrogenation in, A., 1254.  
 Amytal, anæsthetic action of, A., 88.  
 Anabesine, constitution of, A., 405.  
 identity of, with *neonicotine*, A., 287.  
*dl*-Anabasine, and its salts and derivatives, A., 952.  
*N*-Anabasines, amino-, and their salts and derivatives, A., 952.  
*Anabasis aphylla*, alkaloids of, A., 405, 758, 952.  
 Anæmia, inhibition of, by subjecting blood to ultra-violet light, A., 959.  
 catalase and glutathione content of blood-corpuscles in, A., 1156.  
 from lack of histidine and tryptophan, A., 80.  
 plasma-catalase in, A., 1056.  
 vitamin-B in, A., 959.  
 vitamin-D deficiency in relation to, A., 658.  
 effect of chlorophyll in, A., 1151.  
 effect of food cereals in, A., 868.  
 effect of pyrrole derivatives in, A., 1151.  
 effect of soya-bean products in, A., 1151.  
 milk, in rats, effect of radiant energy on, A., 959.  
 nutritional, metals for prevention of, in rats, A., 641.  
 value of oysters in, A., 959.  
 value of vegetables in, A., 1056.  
 of cattle, due to deficiency of iron or iron and copper, A., 80.  
 in rats, A., 79.  
 pernicious, deficiency factor in, A., 1156.  
 liver therapy in, A., 1156.  
 relation between oxygen consumption and nitrogen metabolism in, A., 186.  
 pigment metabolism and blood destruction in, A., 186.  
 curative principle for, from hog's stomach, A., 884.  
 glutathione content of products used in treatment of, A., 640.  
 potency of liver extracts in, A., 296.  
 secondary, liver extract for, (P.), B., 704.  
 Anæsthesia, ether, effect of, on blood-sugar, A., 301.  
 ether, ethylene, and nitrous oxide, effect of carbon dioxide on, A., 87.  
 Anæsthesin, reactions of, A., 632.  
 detection of, colorimetrically, B., 785.  
 determination of, B., 576.  
 Anæsthetics, manufacture of solutions of, (P.), B., 577.  
 production of compounds for use as, (P.), B., 912.  
 basal, relative efficiency of, A., 88.  
 local, A., 424.  
 manufacture of, (P.), B., 704.  
 relative toxicity and efficiency of, A., 540.  
 alkaline esters of aromatic acids as, (P.), B., 288.  
 esters of dialkylaminomethanols as, A., 1061.  
 testing of, B., 448.  
 determination of, B., 376.  
 detection of, B., 1007.  
 Analysis, calibration of apparatus for, A., 828.  
 specifications for reagents for, A., 240.  
 probable error in, A., 38.  
 of anions, A., 1101.  
 of cations without ammonium sulphide, A., 489.  
 of metals of the ammonium sulphide group, A., 1104.  
 acidimetric, standards for, A., 353.  
 and alkalimetric, use of *s*-diphenylguanidine in, A., 241.  
 Analysis, alkalimetric, salicylic acid as standard in, A., 135.  
 argentometric, use of acidimetric indicators in, A., 922.  
 atomic, by X-rays, A., 586.  
 capillary, A., 1198.  
 centrifugal, A., 240.  
 colorimetric, A., 717, 827, 920.  
 standards for, A., 135, 827.  
 use of colour filters in, A., 978.  
 conductometric, A., 135.  
 titration, apparatus for, A., 135.  
 electrochemical, with alternating current, A., 828.  
 electrolytic, use of electromagnetic microbalance in, A., 37.  
 electrometric, apparatus for, (P.), B., 515.  
 titration, apparatus for, A., 1013; (P.), B., 353.  
 use of vacuum tube in, A., 814.  
 gasometric, A., 923.  
 gravimetric, rationalisation of, A., 825.  
 without ignition of precipitates, A., 1010.  
 indirect, A., 134.  
 iodometric, quantitative re-formation of iodine in, A., 710.  
 luminescence, A., 1011.  
 macro-electrochemical, A., 923.  
 magneto-optical, A., 240.  
 micro-acidimetric, A., 353.  
 micro-alkalimetric, A., 353.  
 microchemical, A., 240, 586.  
 by distillation, A., 1219.  
 electric furnace for, A., 37.  
 filtering cup for, A., 828.  
 in industrial laboratories, A., 72, 1149; B., 403.  
 polarographic, A., 1101.  
 titration, A., 1222.  
 microcolorimetric, A., 531.  
 micro- and semimicro-combustion, use of metal tube in, A., 631.  
 micro-electrolytic, apparatus for, A., 492.  
 micro-elementary combustion, A., 921.  
 microscopic, sampling for, B., 131.  
 nephelometric, preparation of test solutions for, A., 353.  
 potentiometric, A., 353.  
 recording apparatus for, A., 592.  
 unattackable electrodes for, A., 241.  
 titration, A., 33.  
 fixing of end-points in, A., 241.  
 use of ceric sulphate in, A., 34.  
 precipitation, A., 922.  
 qualitative, of acid radicals, A., 1219, 1220.  
 of cations, A., 354.  
 of metals of group IIb, A., 1223.  
 by Becquerel rays, A., 1220.  
 separation of elements in, A., 827.  
 elimination of phosphates in, A., 136.  
 quantitative, A., 487.  
 by thermal decomposition of metallic sulphates, A., 489.  
 with X-rays, A., 356.  
 refractometric, A., 1225.  
 X-ray, in metallurgy, B., 349.  
 sedimentation, A., 485; B., 963.  
 spectroscopic. See Spectroscopic analysis.  
 thermometric titration, A., 920.  
 toxicological, destruction of organic matter for, A., 978.  
 volumetric, A., 1101.  
 apparatus for, A., 714.  
 preparation and standardisation of solutions for, A., 828.  
 liquid amalgams in, A., 1011.  
 stability of solutions for, A., 1101.  
 Analysis, volumetric, use of bromates in, A., 137.  
 use of diphenylamine or diphenylbenzidine as internal indicators in, A., 243.  
 thallium carbonate as standard in, A., 241.  
 acid-base, error in, A., 1101.  
 Anataze in N. Brazil, A., 493.  
 Anavenoms, A., 1155.  
*Anchusa tinctoria*, detection of, B., 817.  
 Andesite from Cserhát Mts., Hungary, A., 715.  
 from Java, A., 1229.  
 use of, as substitute for acid-resisting ceramic ware, B., 105.  
 Androkinin in urine of women, A., 547.  
 Anethole nitrosite, A., 943.  
 Angostura alkaloids, A., 1046.  
 Anhydrides, acid, use of kcten in preparation of, A., 1018.  
 aliphatic, manufacture of, (P.), B., 792.  
 aromatic, preparation of, A., 1246.  
 organic, determination of, in presence of acids, A., 42.  
 Anhydrite, formation of, A., 482.  
 velocity of solution of, A., 702.  
 hydration of, in presence of calcium hydroxide, B., 772.  
 manufacture of hydraulic products from, (P.), B., 508.  
 Anhydroacetylpanaxsapogenin, A., 517.  
 Anhydrocotarnino-*p*-anisidine, A., 1047.  
 Anhydrocotarnino-3:5-dimethylpyrazole, A., 1047.  
 Anhydrocotarnino-1:5-diphenyl-3-methylpyrazole, A., 1047.  
 Anhydrocotarnino-*p*-hydroxytoluene, A., 1047.  
 Anhydrocotarnino-3-methylpyrazolone, A., 1047.  
 Anhydrocotarninophenetidines, A., 1047.  
 Anhydrocotarnino-5-phenyl-3-methylpyrazole, A., 1047.  
 Anhydrocotarnino-1-phenyl-3-methylpyrazolone, A., 1047.  
 Anhydrocotarninophloroglucinol, and its hydrochloride, A., 1047.  
 Anhydrocotarninopyrogallol, A., 1047.  
 Anhydrocotarninoreoscinol, and its hydrochloride, A., 1047.  
 Anhydriodichloralcarbamide, A., 151.  
 Anhydriodol-1:8-dicarboxynaphthyl) 5:5'-disulphide, A., 839.  
 Anhydriodihydrostrophanthidin, derivatives of, A., 1138.  
 Anhydriodihydrostrophanthidinic acid, A., 1138.  
 Anhydrofructose, from inulin, structure of, A., 603.  
 3:6-Anhydrogalactose, and its phenylosazone, A., 1237.  
 Anhydroglucose, and its triacetate, A., 1237.  
 Anhydro-6-hydroxy-7-methoxy-1-(3'-benzyloxy-4'-methoxy)benzylisoquinoline methoxyhydroxide, A., 175.  
 Anhydro-2:6-dihydroxy-4-methyl-3-( $\beta$ -hydroxyethyl)pyridine, A., 951.  
 Anhydromarmelosin, A., 1035.  
 3:6-Anhydro- $\alpha$ -methylgalactoside, A., 1237.  
 Anhydro-*N*-methylpapaverolinium picrate and hydroxide, A., 527.  
 Anhydro-*N*-methyl-*O*-tribenzoylpapaverolinium hydroxide, A., 527.  
 Anhydrosalicylidenebisdi-indone, A., 1252.  
 Anhydrotetrahydromethylstrychnine, and its derivatives, A., 629.  
 Anilides, chlorination of, A., 153, 1002.  
 phenolic, halogenation of, A., 26.

- Aniline**, effect of silver nitrate on surface tension of aqueous solutions of, A., 1200.  
equilibrium of, with allylthiocarbimide and benzene, A., 913.  
with ethyl- and diethyl-anilines, A., 574.  
hydrogenation of, A., 378.  
effect of water on nitration of, A., 508.  
condensation of, with acetaldehyde, A., 1124.  
condensation products of crotonaldehyde and, (P.), B., 974.  
and *p*-bromo-, condensation of, with pernitrosocamphor, A., 517.  
action of, with amides, A., 732.  
on glucose, in presence of acetic acid, A., 1241.  
hydrochloride, reaction of, with sodium nitrite in methyl alcohol, A., 1125.  
hydrohalides, conductivity of aniline solutions of, A., 342.  
derivatives, Raman spectra of, A., 1076.  
determination of, by means of picryl chloride, A., 1149.
- Aniline**, bromo-, chloro-, and nitro-derivatives, *p*-toluenesulphonates, A., 375.  
*s*-tribromo-, oxidation of, by chromic anhydride, in acid solution, A., 1025.  
*p*-chloro- and *p*-nitro-, diazotised, additive compounds of, with hydrocyanic acid, A., 156.  
3-chloro-6-bromo-, A., 266.  
2-chloro-4-nitro-, preparation of phthalazine, phthalazone, and phthalimidine derivatives from, A., 284.  
nitro-derivatives, catalytic reduction of, in presence of aldehydes and ketones, A., 154.  
condensation of, with bromal, A., 1124.  
*m*-nitro-, preparation of, A., 50.  
*p*-nitro-, production of, from *p*-chloronitrobenzene, B., 137.  
*tetranitro*-. See Tetryl.
- Aniline black**, condensate from steaming of, B., 139.  
uses of, B., 541.  
dyeing with, B., 839; (P.), B., 883.  
production of white and coloured reserves under, (P.), B., 721.
- Anilinesulphonic acids**, manufacture of, (P.), B., 496.  
*o*-Anilinoacetophenone, *m*-nitro-, A., 744.  
4-Anilino-7-acetyl-3,9-dimethyl-4:5-dihydro-uric acid, 5-hydroxy-, A., 1045.  
6-Anilinobenzaldehyde, 2:4-dinitro-, phenylhydrazone, A., 851.  
*o*-Anilinobenzhydryl-*p*-bromophenylacetylene, and its hydrochloride, A., 260.  
*o*-Anilinobenzhydryl-*β*-naphthylacetylene, and its hydrochloride, A., 260.  
*o*-Anilinobenzhydrylphenylacetylene, and its hydrochloride, A., 260.  
*o*-Anilinobenzhydryl-*p*-tolylacetylene, and its hydrochloride, A., 260.  
4-Anilinobenzophenone, 3-amino-, A., 65.  
*β*-Anilinobutyric acid, and its derivatives, A., 375.  
*β*-Anilino-*β*-(5-carbethoxy-2-methyl-3-pyr-ryl)ethane-*αα*-dicarboxylic acid, A., 281.  
4-Anilinodehydro-*β*-naphthol 1-sulphide, 3-bromo-, A., 379.  
10-Anilino-1:4-dimethylanthrone, 5:8-di-chloro-, A., 1135.  
2-Anilinoethenyl-3:3-dimethylindolenium methiodide, A., 756.  
2-Anilinoethenyl-6-ethoxyquinoline ethiodide, A., 756.  
2-Anilinoethenylpyridine methiodide, A., 756.
- Anilinoethenylquinolines**, ethiodides of, A., 756.  
4-Anilinoethoxy-2-methylquinolines, and their salts, A., 951.  
2-Anilino-4-ethoxyquinazoline, and its salts, A., 755.  
*o*-Anilino-1-*β*-hydroxynaphthylmethane, reaction of, with phenylcarbimide, A., 52.  
4-Anilino-8-methoxy-2-methylquinoline, A., 951.  
2-Anilino-4-methoxyquinazoline, and its salts, A., 755.  
5-Anilino-3-methyl-2:1-phenylenethiaz-thionium chloride, A., 525.  
5-Anilino-3-methylthiophenol, 2-amino-, and its derivatives, A., 525.  
4-Anilino-3-naphthanilide, 1:2-dihydroxy-, A., 1129.  
1-Anilino-*β*-naphthol, 1-*p*-amino-, A., 379.  
Anilinonor-ricinine, A., 526.  
*β*-Anilino-*α*-phenyl-*β*-anisylpropiphenone, A., 514.  
2-Anilino-5-phenyl-1:3:4-furodiazole, and its derivatives, A., 172.  
*o*-Anilinophenyl-*β*-hydroxynaphthylmeth-anes, reaction of phenylcarbimide with, A., 157.  
*β*-Anilino-*α*-phenyl-*β*-3:4-methylenedioxy-phenylpropiphenone, A., 514.  
3-Anilino-5-phenyl-1:2:4-oxadiazole, A., 758.  
4-Anilino-2-phenylquinoline, synthesis of, and its salts and derivatives, A., 1039.  
4-Anilinopyridine, 3:5-dibromo-, A., 623.  
4-Anilinoquinoline derivatives, A., 951.  
5-Anilinetetrazole, 1-amino-, and its deriv-atives, A., 172.  
Anilinoquinoline, trypanocidal action of de-derivatives of, A., 623.  
Anilinoquinolinecarboxylamides, and their trypanocidal action, A., 522.  
Animals, value of iodine for, A., 1162.  
fresh-water and marine, metabolism of. See under Metabolism.  
marine borer, coagulation of proteins in, A., 425.  
Animal carcasses, handling and chilling of, (P.), B., 47.  
Animal matter, curing or smoking of, (P.), B., 47.  
Animal tissues, isolation of unstable substances from, A., 1154.  
living, determination of  $p_{\text{H}}$  in, A., 638.  
See also Tissues.  
*m*-Anisaldoxime, A., 384.  
Anise, detection in, of coniine, B., 448.  
Anisic acid, *p*-phenylphenacyl ester, A., 745.  
*o*-Anisidine, sulphonation of, A., 378.  
manufacture of derivatives of, (P.), B., 221.  
*o*-Anisidine, *mono*- and *di*-bromo-, and their derivatives, A., 378.  
*p*-Anisidine, 2:5-dichloro-, and its deriv-atives, A., 943.  
2:3:5:6-tetrachloro-, and its derivatives, A., 379.  
Anisidinobenzhydrylphenylacetylenes, A., 260.  
4-*p*-Anisidinoethoxy-2-methylquinolines, and their salts, A., 951.  
4-*p*-Anisidinomethoxy-2-methylquinolines, and their salts, A., 951.  
4-*p*-Anisidino-2-methylquinoline, and its salts, A., 951.  
Anisole, 2:6-di-bromo- and 2:6-di-chloro-, A., 613.  
2:4:6-tribromothio-. See Phenyl methyl sulphide, 2:4:6-tribromo-.  
4-chloro-3-nitro-, A., 842.  
3-fluoro-, A., 945.
- Anisole-4-sulphinic acid**, 2-amino-, acetyl derivative, A., 378.  
**Anisole-4-sulphonic acid**, 2-amino-, acetyl derivative, and 2-chloro-, derivatives of, A., 378.  
**Anisotropic liquids** in electric fields, A., 677.  
**Anisotropy** in relation to Kerr effect and molecular structure, A., 794.  
molecular, and Raman effect, A., 792.  
and magnetic birefringence, A., 678.  
4-*p*-Anisoxylbenzaldehyde, 2-fluoro-, and its azlactone, A., 1247.  
6-Anisoyl-2-anisyl-5:6-dihydro-1:4-pyran, 3-eyano-, A., 63.  
(-)Anisoylformic acid, menthyl ester, A., 1037.  
*α*-Anisoyl-*β*-phenylethylene oxide, A., 617.  
δ-Anisovaleric acid, A., 63.  
Anisyl alkyl sulphides, A., 1244.  
4-methyl sulphide, 2-amino-, acetyl de-rivative, A., 378.  
radical, affinity capacity of, A., 389, 390, 393, 394.  
4-disulphoxide, 2-amino-, acetyl de-rivative, A., 378.  
*p*-Anisyl *n*-amyl sulphide, A., 844.  
*N*-Anisyl-3-acetyl-5-phenyl-2-methylpyr-roles, and their derivatives, A., 1263.  
*α*-Anisyl-*αβ*-amylene glycol, A., 392.  
*α*-*o*-Anisyl-*α*-*p*-anisylethanol, A., 390.  
*β*-*p*-Anisyl-*β*-*o*-anisylethylamine, *β*-hydr-oxyl-, and its hydrochloride, A., 391.  
*α*-Anisyl-*α*-*p*-anisylethylenes, and their de-rivatives, A., 390.  
Anisyl *α*-anisylethyl ketone, and its semi-carbazone, A., 394.  
*m*-Anisyl *α*-*p*-anisylethyl ketone, and its derivatives, A., 390.  
Anisyl *α*-anisyl-*n*-propyl ketone, and its semicarbazone, A., 394.  
9-*p*-Anisyl-10-anthrone, 9-hydroxy-, A., 617.  
*p*-Anisyl benzyl 1:2-diketone, and its quinoxaline derivative, A., 1031.  
*α*-Anisylbenzyl ethyl ketone, A., 394.  
Anisyl benzyl ketone, A., 947.  
and its oxime, A., 516.  
*α*-Anisylbutaldehyde, and its semicarbazone, A., 392.  
*α*-Anisyl-*αβ*-butylene glycol, A., 392.  
*α*-Anisyl-*n*-butyl ethyl ketone, and its semicarbazone, A., 394.  
*α*-Anisyl-*n*-butyl *α*-propyl ketone, A., 389.  
2:3-(2-Anisylchromano-3:4)-quinoline, A., 175.  
*α*-Anisyleinnamic acid, *m*-bromo-, A., 1047.  
*β*-Anisyletronic acid, A., 513.  
Anisylalkyl glycols, molecular trans-positions of, A., 393.  
*p*-Anisyl *p*-diphenyl ethyl ketone, A., 853.  
*α*-Anisyl-*β*-ethylbutylene, and its oxide, A., 389.  
*α*-Anisylethyl ethyl ketone, and its deriv-atives, A., 394.  
*α*-Anisylethyl methyl ketones, and their semicarbazones, A., 389.  
*α*-Anisyl-*β*-ethylpentane-*αβ*-diols, A., 394.  
Anisylethylsulphone, A., 1244.  
*β*-Anisylglutaconic acid, derivatives of, A., 513.  
*β*-Anisylglutaric acid, and its derivatives, A., 513.  
*β*-Anisylglutaric acids, *αβ*-di-bromo-, A., 513.  
Anisylglycollic acids, ethyl esters, A., 389.  
*α*-Anisyl-4'-heptene, and its oxide, A., 394.  
1-Anisylideneamino-4-benzeneaznaphthal-ene, paracrystalline and crystalline, A., 1080.  
Anisylidenebisacetoacetic acid, ethyl ester, A., 513.

- Anisylidenecyanoacetic acid, 3-nitro-, A., 1247.
- Anisyl methoxybenzyl ketones, and their semicarbazones, A., 390.
- Anisyl-2-methyl-1-anthraquinonyl ketone, A., 274.
- 2-Anisyl- $\alpha$ -methyl-*n*-butaldehyde, and its derivatives, A., 394.
- 2-Anisyl- $\beta$ -methylbutane- $\alpha$ - $\beta$ -diol, A., 393.
- $\alpha$ -Anisyl- $\beta$ -methyl-*n*-butyl alcohol, A., 393.
- $\alpha$ -Anisyl- $\beta$ -methyl- $\alpha$ - $\beta$ -butylene, iodohydrin and oxide, A., 393.
- $\alpha$ -Anisyl- $\alpha$ -methylbutyronitrile, A., 394.
- 9-Anisyl-2-methyl-9-oxanthrone(10)-1-carboxylic acid, lactone, A., 275.
- $\alpha$ -Anisyl- $\alpha$ -methylpropaldehydes, and their semicarbazones, A., 390.
- $\alpha$ -Anisyl- $\beta$ -methylpropan- $\alpha$ -ols, A., 389.
- $\alpha$ -Anisyl- $\beta$ -methyl- $\Delta$ -propylenes, and their oxides, A., 389.
- $\alpha$ -Anisyl- $\beta$ -methyl- $\alpha$ - $\beta$ -propylene glycols, A., 389.
- Anisylmethylsulphone, A., 1244.
- Anisyl-4-methylsulphone, 2-amino-, acetyl derivative, A., 378.
- $\alpha$ -Anisyl- $\beta$ -(1-naphthyl)thiocarbamides,  $\alpha$ -chloro-, A., 154.
- $\alpha$ -Anisylpentan- $\alpha$ -ol- $\beta$ -one, A., 394.
- $\gamma$ -Anisyl- $\Delta$ - $\beta$ -pentene, A., 394.
- m*-Anisyl  $\beta$ -phenyl- $\alpha$ -*p*-anisylethyl ketone, A., 390.
- $\gamma$ -*p*-Anisylpropan- $\alpha$ -ol, and its phenylurethane, A., 505.
- $\alpha$ -Anisylpropan- $\alpha$ -ol- $\beta$ -one, A., 393.
- $\beta$ -*p*-Anisylpropionic acid, ethyl ester, A., 505.
- $\alpha$ -Anisyl- $\beta$ -propylamylene, and its oxide, A., 389.
- $\alpha$ -Anisyl- $\alpha$ - $\beta$ -propylene glycol, A., 392.
- $\alpha$ -Anisyl-*n*-propyl ethyl ketone, and its semicarbazone, A., 389.
- m*-Anisyl  $\beta$ -propyl ketone, and its semicarbazone, A., 390.
- $\alpha$ -Anisyl- $\beta$ -propylpentane- $\alpha$ - $\beta$ -diol, A., 389.
- 4-Anisylpyridine, 2:6-dihydroxy-, and its salts, and oximino-, A., 513.
- 2-Anisylquinoline-4-carboxylic acid, stimulation of uric acid excretion by, A., 89.
- o*-Anisyltetrazole, 5-amino-, A., 1044.
- o*-Anisylthiocarbamide, 5-chloro-, A., 154.
- Anisylthiocarbimides, chloro-, A., 154.
- Anisylthiourethanes, and chloro- and nitro-, A., 154.
- N*- $\alpha$ -Anisyl-*N'*-*p*-tolyl-*N*-methylbenzamide, and its picrate, A., 1242.
- $\alpha$ -*m*-Anisyl- $\beta$ -(*p*-tolyl)thiocarbamide,  $\alpha$ -5-chloro-, A., 154.
- $\alpha$ -Anisylvaleraldehyde, and its semicarbazone, A., 392.
- Anatto powder, red, vitamin-A activity from, A., 433.
- Anodes, potential gradients on films on, A., 915.
- passivity of, in nickel baths, B., 113.
- ferrochromium and ferromanganese, potentials of, A., 914.
- platinum, loss from, in electrolysis of alkaline solutions, A., 1096.
- Anonaine, A., 526.
- Anopheles*, charcoal as diluent for Paris green for destruction of larvæ of, B., 907.
- Anorthite, sliding of, A., 493.
- Anserine in mammalian muscle, A., 532.
- methyl derivative, chloroaurate, A., 863.
- Ants, fire, control of, in the Rio Grande valley, B., 698.
- Anthelmintics from Brazilian plants, B., 161.
- Anthocyanidins, stability of, towards ferric chloride, A., 400.
- Anthocyanins, A., 101, 665, 1296.
- synthesis of, A., 859, 1038, 1140.
- chemistry of, A., 949.
- formation of, in fruit harvested unripe, A., 312.
- stability of, towards ferric chloride, A., 400.
- interaction of, with flavones, A., 750.
- diglycosidic, constitution of, A., 1257.
- nitrogenous, synthetic experiments on nature of, A., 750.
- Anthracene, purification of, (P.), B., 497, 975.
- absorption spectrum of, A., 674.
- vapour, photo-ionisation of, A., 1076.
- heat of combustion of, A., 229.
- hydrogenation of, B., 172.
- catalytically, A., 152, 1123.
- oxidation of, with chromic acid, A., 917.
- derivatives, A., 1135, 1241.
- ketonic derivatives of, A., 1135.
- commercial, determination of phenanthrene in, A., 182.
- Anthracene-3-carboxylic acid, and its arylamides, manufacture of, and azo-dyes therefrom, (P.), B., 592.
- Anthracite, Pennsylvanian, constitution and comparison of, with bituminous coal, B., 869.
- and related materials, physical properties of, B., 823.
- Anthracyl-2-anthraquinonyl ketones, and hydroxy-, A., 1135.
- Anthracyl chloro-2-anthraquinonyl ketones, A., 1135.
- Anthrahydroquinones, production of esters of, (P.), B., 139.
- Anthranilamide-4-arsinic acid, and its *N*-acetyl derivative, A., 180.
- Anthranilic acid 4-arsenoxide, methyl ester, A., 180.
- Anthranilic acid dichloroarsines, hydrochlorides, A., 180.
- Anthranyl 9-methyl ethers, *mono*- and *di*-chloro-, and *dichloro*-10-bromo-, A., 745.
- Anthraquinone, heat of combustion of, A., 229.
- and its derivatives, halogenation of, (P.), B., 460.
- sulphonation of, by sulphur trioxide, B., 138.
- derivatives, manufacture of, (P.), B., 57, 222, 541, 764, 833, 1115.
- containing selenium, (P.), B., 975.
- adsorption of, by cotton cellulose, A., 224.
- ketonic, A., 1135.
- Anthraquinone, amino-, manufacture of derivatives of, (P.), B., 1115.
- 2-amino-, production of, (P.), B., 764.
- manufacture of leuco-esters of carbamides of, (P.), B., 96.
- sulphuric acid ester of, (P.), B., 672.
- 1:4-diamino-, manufacture of, (P.), B., 764.
- 1:4:5:8-tetraamino-, production of leuco-compound of, (P.), B., 793.
- 2:4:6:8-tetrabromo-1:5-diamino-, A., 618.
- 1:8-dihydroxy- (*chrysazin*), synthesis of, A., 164.
- salts of, A., 164, 1035.
- colour reactions of, B., 863.
- 2-fluoro-1-amino-, production of, (P.), B., 496.
- 3-fluoro-2-amino-, production of vat dyes from, (P.), B., 793.
- Anthraquinones, manufacture of, (P.), B., 301, 333, 1115.
- manufacture of condensation products of, (P.), B., 139, 253, 1020.
- Anthraquinones, amino-, oxidising agents in preparation of, A., 1135.
- production of derivatives of, (P.), B., 975.
- diamino-, dinitro- and nitroamino-, and their derivatives, A., 60.
- trichloro-, synthesis and orientation of, A., 273.
- tri*- and *tetra*-chloro-, A., 273.
- halogeno-, separation of, (P.), B., 95.
- hydroxy-, A., 164.
- action of, on salt films, A., 569.
- coupling of, with salicin, A., 370.
- Anthraquinone dyes, manufacture of, (P.), B., 175, 497, 765.
- and their intermediates, (P.), B., 139, 175.
- for acetate silk, manufacture of, (P.), B., 765.
- for wool, (P.), B., 333.
- acid, manufacture of, (P.), B., 140.
- for wool, (P.), B., 58, 174, 222, 1115.
- indigoid, (P.), B., 301.
- vat, manufacture of, (P.), B., 15, 139, 175, 379, 672, 793, 834, 879, 928.
- from furoyl chloride, B., 834.
- violet, for wool, manufacture of, (P.), B., 222.
- Anthraquinoneacridone dyes, vat, manufacture of, (P.), B., 302, 379.
- Anthraquinoneazo-compounds, B., 174.
- Anthraquinoneazo-naphthol AS dyes, light absorption of, B., 174.
- Anthraquinonebenzocridones, chloro-derivatives of, (P.), B., 541.
- Anthraquinone-1-carboxyl chlorides, tautomerism of, A., 274.
- Anthraquinonecarboxylic acids, manufacture of, (P.), B., 57.
- Anthraquinone-1:5-dicarboxyl chloride, tautomerism of, A., 617.
- Anthraquinone-1:5-dicarboxylic acid, 2:4:6:8-tetrabromo-, and its ethyl ester, A., 618.
- Anthraquinone-2:6-dicarboxylic acid, 1:5-dichloro-, A., 1136.
- Anthraquinonedisulphonic acids, 2-amino-, and *mono*- and *di*-chloro-, orientation of, and their potassium salts, A., 273.
- Anthraquinone-2:1:6:5-dixanthone, A., 400.
- Anthraquinone-indigo dyes, vat, manufacture of, (P.), B., 15.
- Anthraquinonenaphthacridone, production of derivatives of, (P.), B., 592.
- Anthraquinonenaphthacridone dyes, manufacture of, (P.), B., 140.
- Anthraquinonenitriles, amino-, manufacture of, (P.), B., 222.
- Anthraquinone-2-sulphonic acid, preparation of, from *o*-benzoylbenzoic acid, A., 947.
- Anthraquinone-2-sulphonic acid, 1-amino-, preparation of, (P.), B., 174.
- Anthraquinonesulphonic acids, preparation of, by Friedel-Crafts reaction, A., 396.
- Anthraquinonesulphonic acids, 1-amino-4-hydroxy- and 1-hydroxylamino-, sodium salts, A., 274.
- mono*- and *di*-chloro-, orientation of, and their derivatives, A., 273.
- nitro-, salts, reduction of, A., 274.
- Anthraquinonyl 2- $\alpha$ - $\beta$ -acetoglucoxybenzyl ether, 1:2-dihydroxy-. See 2-Acetosalicosylalizarin.
- $\alpha$ - $\beta$ -acetoglucoxybenzyl ether, 1:8-dihydroxy-. See 8-Acetosalicosylchrysazin.
- 2-Anthraquinonylguanidine, and its salts, A., 405.
- Anthrax, sterilisation of dried hides infected by, B., 238.

- Anthrone**, 1:4-dichloro-10-bromo-, A., 746.  
2:3-dichloro-10-nitro-, A., 745.
- Anthrones**, influence of *Bz*-substituents on reactions of, A., 745.  
substituted, preparation of, A., 617.
- Anthrones**,  $\alpha$ -chloro-, orientation of, A., 395.
- Anthrone series**, A., 164.
- Anthroxyl radicals**, potentiometric study of, A., 1208.
- Antibodies**, A., 94, 430, 653.  
effect of industrial poisons on formation of, A., 1060.  
reactions of, A., 1054.
- Antifluorescents**, A., 578.
- Anti-freezing mixtures**, (P.), B., 533.  
for use in radiators, B., 820; (P.), B., 452.
- Antigens**, structure and production of, A., 1054.  
preparation of, (P.), B., 400.  
from  $\alpha$ - and  $\beta$ -glucosides and proteins, A., 957.  
bacterial, electric charge of, A., 1290.  
mixed, analysis of, by adsorption, A., 1153.  
specific, production of, (P.), B., 1056.
- Antiglyoxalase**, pancreatic, A., 543.
- Anti-knock compounds**, (P.), B., 492.  
production of, (P.), B., 1019.
- Anti-malarials**, A., 167, 1047, 1263.
- Antimonides**, transformation of, into alloys, A., 455.
- Antimonite**, A., 596.
- Antimony**, recovery of, from zinc distillation residues, (P.), B., 1123.  
volatilisation of, in converters, B., 606.  
atoms, reflexion of, from sodium chloride crystals, A., 1185.  
action of potassium cyanate on, A., 239.  
electrolytic, X-ray structure of, A., 479.
- Antimony alloys**, magnetic susceptibility of, A., 686.  
with aluminium, A., 1082.  
with bismuth, X-ray structure of, A., 567.  
with cadmium, crystal structure of, A., 686.  
with lead, A., 907.  
with lead and tin, equilibrium of, A., 1082.
- Antimony dibromide**, dichloride, and oxide, A., 762.  
tribromide, polybromides of, A., 1008.  
trichloride, electrical conductivity of concentrated solutions in, A., 23.  
dielectric constant of, A., 677.  
equilibrium of, with ethyl ether, A., 1206.  
halides, complex formation in ether solutions of, A., 1206.  
trioxide, equilibria of lead monoxide and, B., 681.  
trisulphide, chemistry of, B., 834.  
desulphurisation of, with carbon monoxide, B., 1077.  
thermochemistry of, A., 812.  
solubility of, in ammonia and ammonium carbonate, A., 908.
- Chloroantimonates**, A., 31.
- Antimony organic compounds**, A., 866.  
manufacture of, (P.), B., 80, 818.  
cyclic, fission of dihalides of, A., 528.  
**Antimony cyclopentamethylene chloride**, A., 528.  
tri-2-thienyl, A., 762.
- Antimony detection, determination, and separation** :—  
detection of, toxicologically, A., 879.
- Antimony detection, determination, and separation** :—  
determination of, using manganese sulphate, A., 1104.  
volumetrically, in alloys and ores, B., 1083.  
in copper, B., 1121.  
in copper and its alloys, B., 801.  
in lead alloys, B., 941.  
separation of, from tin, A., 591.
- Antimony electrodes**. See under **Electrodes**.
- Antimony minerals** containing calcium, A., 829.
- Antimony ores**, sulphide, electrolytic working-up of, B., 66.
- Antimony white**, B., 687, 1126.
- Anti-oxidants** for rubber, oils, soaps, etc., (P.), B., 460.
- Antioxygens**, A., 578.
- Antiprophthrombin** in relation to globulins, A., 413.
- Antipyretics**, effect of, on blood-coagulation, A., 1273.
- Antipyrine**, manufacture of, (P.), B., 1104.  
detection of, in pyrimidone, B., 816.
- Antipyrine**, nitroso-, chromoisomerism of, A., 1144.
- Antipyrinehomophthalimide**, A., 624.
- Antipyriliminophthalonimide**, A., 624.
- Antipyrilphthalon-N-naphthylimides**, A., 624.
- Antipyrilphthalon-N-phenylimide**, A., 624.
- Antipyrilphthalon-p-tolylimide**, A., 624.
- Antiseptics**, testing of, B., 401.
- Antithyroidin**, action of, on gaseous metabolism of rats, A., 781, 970.
- Antitoxins**, A., 1290.  
purification of, A., 1290.
- Antitrypsin**, A., 1166.
- Antiurease**, A., 92.
- Anubing wood**, composition of, B., 385.
- Aorta**, human, calcium and magnesium in, A., 296.  
normal and calcified, iron content of, A., 1277.
- Apatite**, A., 1217.  
crystal structure and formula of, A., 218.  
halogen-free, formation of, A., 481.  
Khibin, B., 62.  
production of fertilisers from, B., 545.  
natural and synthetic, crystal structure of, A., 494.  
determination in, of phosphoric acid, A., 34.
- Apatite-nephelines**, Khibin, decomposition of, by sulphuric acid, B., 382.
- Aphides**, insecticidal value of vegetable oil emulsions against, B., 75.  
pea, control of, in lucerne, B., 570.
- Aphis rumicis**, action of nicotine against, B., 39.
- Aphosphorosis**, chemical diagnosis of, A., 413.
- Aphyllidine**, and its salts, A., 405.
- Aphylline**, and its salts, A., 405.
- Apnoea**, alveolar carbon dioxide in, A., 417.
- Apocynum venetum**. See **Hemp**, Canadian.
- Aporphines**, phenolic, synthesis of, A., 56, 68, 69.
- Apparatus**, adjustable stand and truck for, A., 1106.
- Apples**, production of red pigment in, by artificial light, B., 445.  
wax constituents of cuticle of, A., 203.  
relation of hydrophilic colloids to hardness of, B., 574.  
effect of fungicides on flavour and sugar content of, in storage, B., 1048.  
effect of nitrates on carbohydrate content of, A., 99.
- Apples**, effect of autumn applications of sodium nitrate on, B., 45.  
injuries from summer application of sprays on, B., 569.  
winter spraying of, in the West Midlands, B., 857.  
removal of spray residues from, B., 278, 319.  
control of curculio of, in the Champlain Valley, B., 813.  
effect of temperature on activity and control of plum curculio in, B., 1048.  
oiled wrappings for, B., 655, 955.  
fermentation of juice of, A., 976.  
physiology of, A., 1070.  
Grimes Golden, catalase activity in, A., 99.  
Jonathan, effects of lime-sulphur and white-oil sprays on, B., 318.  
Sturmer pippin, influence of carbon dioxide on internal breakdown in, B., 1103.  
stored, injury to, A., 101.  
Wealthy, composition of bud and spur tissues of, A., 99.  
yellow transparent, constituents of cluster base of, A., 203.  
determination of sugar in, B., 41.
- Apple trees**, distribution of reductase in, A., 99.  
control of borer in, with calcium cyanamide—raw linseed oil mixture, B., 396.  
Baldwin and Greening, yields of, in relation to soils, B., 782.  
Stayman, composition of, A., 99.  
young, control of *Empoasca fabæ* on, B., 813.
- Arabinose**, thio-, and its sodium derivative and tetra-acetate, A., 45.
- Arabinoses**, action of dilute alkali on, A., 723.
- l-Arabitol triphenyl methyl ether**, A., 42.
- Arachis nuts**, use of shells of, as a fuel, B., 631.
- Arachis oil**, B., 994.  
composition of, B., 686.  
hydrogenation of, A., 601.  
catalytic hydrogenation of, A., 1018.
- Arachis seeds**, pressure treatment of, B., 233.
- Aragonite** from lower Rhine basalts, A., 493.  
inner potential of, A., 209.
- Aralia chinensis**, sapogenins of, A., 516.
- Araliaceae**, glucosides of, A., 1140.
- 4-Aralkyl-3-keto-3:4-dihydro-1:4-benzoxazines**, manufacture of, (P.), B., 786.
- Aralkylmercaptans**, desulphhydration of, by potassium hydroxide, A., 266.
- Aralkylvinylcarbinols**, preparation of, A., 616.
- Arbacia**, permeability of eggs of, to ethylene glycol, A., 1162.
- Arcaïne**, A., 294.  
fission of, by micro-organisms, A., 94, 545.
- Archangelisia flava**, alkaloids of, A., 664.
- Arca catechu**, catechin in fruit of, A., 1178.
- Arecoline**, comparison of pelletierine and, B., 527.  
detection of, A., 632.
- Arenicola**, mol. wt. of blood-pigment of, A., 1151.
- Areometer**, piston, A., 38.
- Argemone alba**, alkaloids of, A., 664.
- Argemone mexicana**, alkaloids of, A., 975.
- Argentite**, crystal structure of acantite and, A., 114.
- Argillaceous products**, vitrified, manufacture of, (P.), B., 105, 423.

- Arginase**, A., 650.  
activation and inhibition of, A., 1063.  
tumour, A., 1167.
- Arginine**, determination of, A., 834, 1270.  
in plants, A., 1179.
- Arginine-N-sulphonic acid**, and its potassium salt, A., 1023.
- Arginylarginine**, derivatives of, A., 954.  
dipicrate, A., 1269.
- Arginyloxypyrroline flavianate**, A., 1269.
- "Argocarbon,"** adsorption of intestinal gases by, A., 426.
- Argon**, spectrum of, A., 891.  
Stark effect in, A., 667, 979.  
absorption spectrum of, A., 673.  
absorption and scattering of X-rays by, A., 788.  
optical anisotropy of, A., 1075.  
arc discharge in, A., 551.  
charge and ionisation of, by argon<sup>+</sup>, A., 441.  
discharge potential of, in mercury vapour, A., 1073.  
ionisation of, A., 1184, 1185.  
by neutral argon atoms, A., 553.  
by metastable neon atoms, A., 1184.  
electron scattering in, A., 442.  
mobility of positive alkali ions in, A., 670.  
photo-electrons from, A., 106.  
superconductivity of, A., 905.  
adsorption of, on amorphous carbon, A., 991.  
determination of, A., 1102.
- Armillaria mellea**, chitin from, A., 975.  
effect of, on wood, A., 195.
- Aromatic compounds**, formation of, from hydroaromatic compounds, A., 735.  
infra-red absorption spectra of, A., 559.  
electron distribution in, and substitution, A., 324.  
cationoid reactivity of, A., 622.  
angular values from dipole moments of, A., 794.  
fused, magnetic birefringence of, A., 215.  
quantum theory of, A., 901.  
mercuration of, A., 630.  
sulphuration of, B., 1070.  
action of aromatic alcohols on, in presence of aluminium chloride, A., 611.  
action of fluorine on, A., 151.  
containing oxygen and sulphur, dipole moments of, A., 677.
- Aromatic compounds, o-di-hydroxy-**, manufacture of salts of, (P.), B., 161.
- 2-Aroyl-1,9-thiazolanthrone**, manufacture of, (P.), B., 541.
- p-Arsanilic acid**. See Phenylarsinic acid, p-amino-.
- Arsenic**, B., 845.  
nuclear spin of, A., 551, 1071.  
recovery of, from ores, etc., (P.), B., 660.  
spectrum of, A., 787, 1183.  
arc spectrum of, A., 1071.  
spark spectrum of, A., 668, 1183.  
third spark spectrum of, A., 207.  
treatment of solutions containing, (P.), B., 678.  
action of potassium cyanate on, A., 239.  
use of, in lead-base bearing alloys, B., 606.  
distribution of, and its antigen, in the organism, A., 542.  
biochemical action of, A., 198.  
electrolytic, X-ray structure of, A., 479.  
tervalent, action of nitrosyl chloride on derivatives of, A., 630.
- Arsenic compounds**, action of, on leaves, A., 666.  
pharmaceutical, B., 1104.
- Arsenic bromosulphide**, A., 919.  
trichloride, dielectric constant of, A., 677.  
pentafluoride, preparation, vapour pressure and density of, A., 707.  
halides, complex formation in ether solutions of, A., 1206.  
monohydride, spectroscopic evidence of, A., 207.  
band spectrum of, A., 103.  
tri-hydride (arsine), additive compound of, with boron trichloride, A., 1218.  
trioxide, purification of, (P.), B., 506.  
complexity of, A., 453.  
crystal structure of, A., 218, 326.  
pentoxide, equilibrium of, with lead oxide and water, A., 125.  
with strontium oxide and water, A., 125.
- Arsenious acid**, acidity of, and its diol compounds in aqueous solution, A., 228.  
velocity of reaction of, with iodine, A., 916.  
effect of boric acid on toxicity of, A., 963.  
detection of, in presence of arsenic and phosphoric acids, A., 710.
- Arsenites**, oxidation of, in the air, A., 27.  
pyrolysis of, A., 810.  
thermal conversion of, into arsenates, A., 130.
- Arsenic acid**, esterification of, by yeast, A., 882.  
detection of, in presence of arsenious and phosphoric acids, A., 710.  
determination of, microchemically, by the ceruleomolybdate method, A., 34.
- Arsenates**, biological action of, A., 1065.  
separation of, from arsenites, A., 825.  
detection of, A., 1102.
- Arsenic disulphide**, thermochemistry of, A., 812.
- di- and tri-sulphides**, thermal dissociation of, A., 338.
- trisulphide** sols, coagulation of, by electrolytes, A., 1087.  
by sulphuric acid, A., 805.  
effect of temperature on, A., 1087.  
protection of, by gelatin, A., 122.
- sulphides**, thermal dissociation of, A., 573.
- Arsenic organic compounds**, A., 528, 1268.  
manufacture of, (P.), B., 80, 368, 528.  
aliphatic, manufacture of, (P.), B., 1137.  
amino-, production of, (P.), B., 817.  
cyclic, fission of dihalides of, A., 528.  
heterocyclic, ring fission of, A., 1268.
- Arsenic sulphide**, compounds of, with piperidine and piperazine, A., 952.  
cyclotetramethylene chloride, A., 528.
- Arsenic detection**, determination, and separation:—  
detection of, A., 1221.  
biologically, A., 488.  
detection and determination of, in organic compounds, A., 955.  
determination of, colorimetrically, A., 825.  
electrochemically, A., 242.  
with Gutzeit apparatus, A., 136.  
iodometrically, A., 1221.  
volumetrically, precipitated by hypophosphorous acid, A., 1010.  
in alloys and ores, B., 1083.  
in organic compounds, A., 763, 955, 1052.  
in physiological materials, A., 786.  
in soil extracts, B., 362.  
in impregnated wood, B., 1032.  
separation of, from germanium, A., 356.
- Arseniterephthalic acid**, methyl ester, A., 180.
- Arsenoacetanthranilic acids**, A., 180.
- Arsenoanthranilic acids**, A., 180.
- Arsenobenzenes**, manufacture of, (P.), B., 288, 1104.
- 2:4'-Arsenodiphenyl**, A., 1148.
- 4:4'-Arsenodiphenyl-3:3'-dicarboxylic acid**, and its sodium salt, A., 1148.
- 4-Arsenindazole oxide**, A., 1268.
- Arsine**. See Arsenic trihydride.
- tert.-Arsines**, physical properties of, A., 1119.
- Arsinic acid**, thio-, aryl esters, A., 70.
- Arsinic acids**, manufacture of, (P.), B., 207, 288.  
manufacture of complex compounds of, (P.), B., 528.  
aromatic, containing amide groups, A., 180.  
of the pyridine series, biochemistry of, A., 1060.
- Arsinimines**, constitution of, A., 528.
- 4-Arsino-N-acetantranilic acid hydrate**, A., 180.
- 4-Arsinoanthranilic acid**, and its methyl ester, A., 180.
- 5-Arsino-2-aurothiolbenziminazole-5-arsino-2-thiolbenziminazole**, A., 69.
- p-Arsinoglutaranilic acid**, and its ethyl ester, and *p*-dichloro-, A., 291.
- 4-Arsinophenylglycine**, 2-nitro-, A., 1049.
- 5-Arsinophthalic acid**, and its ammonium salt, A., 180.
- 5-Arsinophthalic acid**, 3-hydroxy-, and its potassium salt, A., 180.
- 4-Arsinosalicylic acid**, A., 180.
- 2-Arsinoterephthalic acid**, A., 180.
- Arsinoterephthalic acid**, and its esters, A., 180.
- p-Arsinoglutaranilic acid**, and its salts and derivatives, A., 291.
- Artemesen**, and its oxime, A., 271.
- Artemionic acid**, and its methyl ester, A., 271.
- Artemisia**, determination in, of santonin, B., 1136.
- Artemisin**, constitution of, A., 271.
- Arthritis**, glucose in blood in, A., 80.
- Artichokes**, globe, constituents of, A., 203.
- Jerusalem**, production of alcohol from, B., 699.  
carbohydrates of, A., 1021.
- Artificial masses**, manufacture of, (P.), B., 688, 737.  
coloured, production of, (P.), B., 808.
- Aryl diselenides and disulphides**, crystal structure of, A., 987.  
selenocyanates, A., 762.
- β-Arylacrylic acids**, α-cyano-, preparation of β-arylethylamines from, A., 843.
- Arylamines**, manufacture of, from aromatic halogen compounds, (P.), B., 763.  
condensation of, with formaldehyde, A., 840.  
reaction of, with cyclohexene and 1:4-dihydronaphthalene, A., 1242.  
formation of diarylthiocarbamides from, A., 840.
- 2-Arylamino-1:4-naphthaquinones**, production of, (P.), B., 254.
- Arylarsinic acids**, oxidation-reduction potentials of, A., 472.  
identification of, by means of hydrobromic acid, A., 1267.
- Arylazoacetoacetic acids**, esters, action of halogens on, A., 377, 1125.
- Arylenethiazoles**, 2-amino-, and their derivatives, manufacture of, (P.), B., 1114.
- β-Arylethylamines**, preparation of, from α-cyano-β-arylacrylic acid, A., 843.



- Arylglycol series, transpositions in, A., 1245.
- Arylglyoximes, amino-, A., 57.
- Arylguanidines, A., 176.
- Arylhydrazines, condensation of, with butyl chloral hydrate, A., 283.
- $\beta$ -Arylhydroxylamines, action of cyanogen on, A., 377.
- Arylidencyanoacetic acids, reaction of, with hypochlorous acid, A., 1247.
- Aryl ketones, optically active, determination of rate of enolisation of, polariscopically, A., 1251.
- Arylpropanolamines, phenolic, A., 157.
- Arylsulphonic acids, salts, reduction of, by phosphorus pentabromide, A., 940.
- Arylsulphonyl halides, reactions of, with metallic derivatives, A., 141.
- Arylthioarsinites, hydrolysis of, A., 761.
- Arylthiocarbimides, substituted, reactivity of thiocarbimido-group in, A., 154.
- Arylvinylcarbinols, preparation of, A., 616.
- Asafetida*, gum and volatile oils of, B., 864.
- umbelliferone in micro-sublimates from, B., 287.
- Asarum oil, A., 889.
- Asarum seoulensis*, essential oil from, A., 663.
- Asarylidenbisdi-indone, A., 1252.
- Asarylidenediketohydrindene, A., 1252.
- Asbestos, structure of, A., 798.
- manufacture of clutch rings from, (P.), B., 487.
- production of frictional coverings from, (P.), B., 244.
- production of waterproof slabs from, (P.), B., 107.
- cement. See under Cement.
- rubber-bonded, manufacture of, (P.), B., 933.
- analysis of, B., 339.
- Asclepias syriaca*, utilisation of stem of, for paper and artificial silk, B., 140.
- Ascophora mucedo*, B., 335.
- Asebotin, constitution of, A., 101.
- Ashing apparatus, A., 926.
- Asparagine, isolation of, from cdestin digests, A., 649.
- L*-Asparagine, equilibria of, with *d*- and *l*-phenylglycolic acids, A., 1205.
- L*-isoAsparagine, A., 936.
- Asparagus, freezing-point depressions of shoots of, A., 205.
- L*-Asparagyl-*L*-tyrosine, A., 936.
- Aspartase, A., 1063.
- Aspartic acid, enzymic hydrolysis and synthesis of, A., 1063.
- Aspartic-*N*-sulphonic acid, and its potassium salt, A., 1023.
- Aspartylaspartic acid, titration constant of, A., 71.
- Aspergillus*, iron and zinc as nutrients for, A., 1168.
- Aspergillus fischeri*, ergosterol and mannitol from, A., 1065.
- Aspergillus flavus*, effect of organic stimulants on production of kojic acid by, A., 1168.
- Aspergillus itaconicus*, formation of itaconic acid and mannitol by, A., 93.
- Aspergillus niger*, influence of aluminium on development of, A., 882.
- mannitol as medium for growth of, A., 306.
- influence of organic substances on growth of, A., 1289.
- effect of rhizopin on growth of, A., 306.
- stimulation of, by zinc sulphate, A., 1168.
- Aspergillus niger*, production of acids by, A., 1168.
- acid formation and mycelium production of, A., 1168.
- chitin from, A., 975.
- citric acid production by, A., 882, 1289.
- influence of iron on, A., 968.
- preparation of growth regulator from, A., 1065.
- production of oxalic acid by, A., 195.
- sugars in, and as nutrients, A., 651.
- action of, on sodium hexosediphosphate and toluene, A., 651.
- Aspergillus oryzae*, metabolic physiology of, A., 651.
- alcoholic fermentation by, A., 1168.
- enzymes of, A., 93.
- Aspergillus versicolor*, growth of, on higher paraffins, A., 653.
- Asphalt, origin of, A., 1016.
- formation of, B., 918.
- manufacture of, (P.), B., 136, 248, 1067.
- by acid treatment, B., 826.
- from cracking-process residues, B., 88.
- separation of, from tars, petroleum, etc., (P.), B., 299.
- from cracked residues, B., 1065.
- from Great Okha Asphalt Lake, B., 967.
- interfacial tension between aqueous solutions and, B., 1111.
- compositions containing, (P.), B., 679.
- manufacture of impregnating and adhesive masses from, (P.), B., 171.
- plastic compositions from, for pavements, etc., (P.), B., 425.
- penetrometer for, B., 297.
- bituminous, analysis of mixtures of road tar and, B., 263.
- natural and petroleum, iodine values of, B., 88.
- petroleum, separation in mixtures of coal-tar pitch and, B., 327.
- detection and determination of rubber in its mixtures with, B., 688.
- Asphalt emulsions. See under Emulsions.
- Asphalt mastic, portable apparatus for manufacture of, (P.), B., 538.
- Asphalt oils, hydrogenation of, B., 1015.
- Asphalt products, production of, from mineral oils, (P.), B., 220, 299.
- Asphaltic materials, production of, (P.), B., 345.
- Asphaltite, soluble, manufacture of, (P.), B., 538.
- Asphodeles*, *l*-glucoside from, A., 148.
- Asphyxiation, chlorine in blood in, A., 412.
- Aspidium, assay of oleoresin of, B., 751.
- Asters, control of leaf-hoppers on, B., 571.
- Asterias*, permeability of eggs of, to ethylene glycol, A., 1162.
- Asthma, bronchial, vital capacity in, A., 417.
- Astronomy, photographic plates for use in, B., 162, 657.
- Asymmetric compounds, synthesis of, A., 1037.
- with catalysts, A., 967.
- Atacamite sols, formation of, A., 1201.
- Atherosclerosis, human, calcification of aorta in, A., 1156.
- Atmosphere, radioactivity of, A., 926.
- infra-red radiation of, A., 108.
- ionisation of, A., 441.
- temperature inversions in, A., 247.
- upper, ionisation tables for, A., 556.
- of the Indian Peninsula, temperature and humidity of, A., 594.
- Atoms, structure of, A., 443, 1187.
- valency variation and, A., 111, 902.
- Atoms, nuclei, structure of, A., 211, 442, 556, 791, 894, 981, 1074, 1187.
- structure and total moment of momentum of, A., 107.
- constitution and stability of, A., 981.
- constitution and spin of, A., 5, 894.
- systematics and statistics of, A., 4.
- transition probabilities of, A., 5, 1072.
- periodic properties of, A., 443, 555, 672.
- neutrons in, A., 672.
- protons in, A., 443.
- collisions of  $\alpha$ -particles with, A., 980.
- disintegration of, A., 672.
- Aitken condensation, A., 113.
- effective radii of, and their groups, A., 446.
- continuous matrix of, A., 319.
- units for problems of, A., 211.
- factors for, A., 105, 316, 895.
- calculation of constants of, A., 556.
- constants and X-ray terms of, A., 1184.
- triple collision of, A., 449.
- space quantisation of, on impact, A., 896.
- tetrahedral field of force of, A., 563, 901.
- quantum theory of, A., 319.
- wave functions of, A., 1187.
- as Fitzgerald oscillators, A., 445.
- periodic groups of, A., 5, 901.
- reflexion of, from crystals, A., 669.
- research on, and  $\alpha$ - and  $\beta$ -rays, A., 1186.
- photo-dissociation of, into ions, A., 554.
- penetration of, by photons, A., 1187.
- determination of  $e/m$  for, A., 444.
- and electrons, A., 669.
- collision of slow electrons with, A., 670.
- independent mobility of ions and, in solids, A., 23.
- traversing of magnetic fields by, A., 106.
- disintegration of, by resonance, A., 106, 672.
- mean lives of, A., 439.
- graph for converting percentage of, into weight per cent., A., 1227.
- adsorbed, behaviour of, A., 332.
- ionisation of, A., 208.
- complex, excitation of, by electron collisions, A., 442.
- light, nuclei of, A., 556.
- magnetic, Ewing's model of, A., 112.
- many-electron, screening constants for, A., 208.
- polarisation, susceptibility, and van der Waals forces of, A., 215.
- radioactive. See Radioactive atoms.
- recoil, range and velocity of, A., 210.
- Atomic moments of metals, A., 217.
- Atomic numbers in relation to ionisation potentials, A., 788.
- and heat of formation, A., 469.
- highest, A., 442.
- Atomic volume. See under Volume.
- Atomic weight of barium, A., 209.
- of beryllium, A., 790.
- of caesium, A., 209.
- of carbon, A., 566.
- of fluorine, A., 106, 209, 317, 554, 670, 895, 980.
- of helium, A., 4.
- of hydrogen, A., 4, 790.
- of iodine, A., 1073.
- of lanthanum, A., 317.
- of lithium, A., 209.
- of nitrogen, A., 115.
- of osmium, A., 1185.
- of rubidium, A., 209.
- of scandium, A., 209.
- of selenium, A., 442, 980.
- of strontium, A., 209.
- of thallium, A., 209.
- of xenon, A., 106.

- Atomic weights, A., 894, 1073.  
report of the Commission on, A., 554.  
standard for, A., 442.
- Atomisers, (P.), B., 831.
- Atophan, dimorphism of, A., 403.  
compound of, with sulphuric acid, A., 955.  
alkali-metal salts, compounds of, with  
1-phenyl-2:3-dialkyl-5-pyrazolones,  
(P.), B., 251.  
chlororrhoea from, A., 639.  
colour reactions of, B., 863.  
detection of, microchemically, A., 955.  
determination of, A., 281; B., 47.  
in presence of salicylic and acetylsali-  
cyclic acids, A., 955.
- Atranol, and its derivatives, A., 61.
- Atroventricular bundle, glutathione and  
phosphorus content of, A., 636.
- Atropine, effect of, on blood-sugar, A., 88.  
on sugar metabolism, A., 965.  
detection of, microchemically, A., 868.  
determination of, in human urine, A., 965.
- Augite, titaniferous, formula of, A., 494.  
from Mt. Löban, A., 494.
- Aurin dimethyl ether, A., 854.
- Aurintricarboxylic acid, ammonium salt.  
See "Aluminon."
- Aurora, infra-red spectrum of, A., 441, 552,  
668, 896.
- 2-Aurothiolbenzimidazole, and its deriv-  
atives, A., 69, 70.
- Austenite, constitution of, A., 15.  
transformation of, below the critical  
range, B., 603.  
to martensite, A., 1196.  
into pearlite, A., 686.  
segregation of cementite from, A., 330.
- Autoclaves, (P.), B., 404.  
constant pressure device for, A., 138.  
lid for removal of vapours from, (P.),  
B., 630.  
tilting, (P.), B., 755.
- Autohaemagglutinin, origin of, A., 76.
- Autolysis, latent period of, A., 193.  
behaviour of phosphorus during, A., 882.
- Automobiles, coatings for, B., 315.
- Autoxidation, A., 558, 703, 1006.  
catalysis of, A., 476.  
of double linkings, A., 1003.
- Auxin, A., 661.
- Avena sativa*. See Oats, wild.
- Avertin, A., 646.  
anaesthetic action of, A., 88.  
detoxication of, A., 1162.  
determination of, in blood, A., 301.
- Avitaminosis, A., 547, 973.  
and blood coagulation, A., 870.  
carbohydrate tolerance in, A., 782.  
gossypol administration during, A., 89.  
polyneuritic, nitrogen metabolism during,  
A., 434.
- Avitaminosis-A, administration of ferrous  
iodide and linoleic acid to rats with,  
A., 1293.  
in chicks, A., 972.
- Avitaminosis-B, A., 547.  
co-carboxylase and co-enzyme in rats  
with, A., 1294.  
oxidation in, and in fasting, A., 1175.
- Avitaminosis-C, changes in blood in, A.,  
1294.
- Avocado seed, chemical composition of, B.,  
320.
- Axolotls, effect of thyroid preparations on  
muscle and liver of, A., 885.
- Azelamidine salts, A., 55.
- Azelic acid, *p*-phenylphenacyl ester, A., 745.
- Azeotropic mixtures, composition of, in rela-  
tion to evaporation temperature, A., 456.  
binary, A., 330.
- Azeotropy, use of, for determination of  
impurities, A., 33, 1098.
- Azides, structure of, A., 114.  
liquid and crystalline, structure of, A., 12.  
reduction of, catalytically, A., 1118.
- Azidoacetamidooacetoneitrile, A., 936.
- dl*- $\alpha$ -Azidoacetamido- $\beta$ -phenylpropionic  
acid, and its ethyl ester, A., 1118.
- Azidoacetic anhydride, A., 936.
- $\beta$ -Azidoacetogalactose, A., 1118.
- Azidoacetoneitrile, A., 936.
- 2-Azidoacetoxypipronic acid, and its ethyl  
ester, A., 936.
- N*-Azidoacetylglucosamine, A., 1118.
- p*-Azidoacetylsalicylic acid, A., 936.
- 5-Azido-1-phenyltetrazole, A., 1044.
- N*- $\alpha$ -Azidopropionylglucosamine, and its  
tetra-acetyl derivative, A., 837.
- $\alpha$ -Azidopropionylglycine, A., 936.
- 4-Azido-1:2-tetrazolophthalazine, A., 1266.
- Azines, thermal decomposition of, A., 1262.
- Azobenzene, electrolytic reduction potential  
of, A., 231.
- Azobenzene, 4-amino- and 4'-nitro-4-  
amino-, phthalazine derivatives of, A.,  
755.  
2-chloro-2'-bromo-, A., 734.  
2:4:2':4'-tetranitro-5-hydroxy-, A., 53.
- Azobenzenes, oximinoamino-, acetyl deriv-  
atives, A., 509.
- m*-Azobenzyl alcohol, and its diacetyl de-  
rivative, A., 1243.
- 2:2'-Azocamphor, See Camphorazine.
- Azochromophores, A., 1243.
- Azo-compounds, photolysis of, A., 1215.  
reactions of, with benzyl alcohol, benz-  
aldehyde, and quinoline, A., 155.  
sulphites of, A., 609.
- Azo-compounds, amino-, formation of, A.,  
1125.  
hydroxy-, molecular compounds of, with  
halides, A., 583.
- Azo-dyes, A., 264.  
manufacture of, (P.), B., 222, 254, 334,  
765, 794, 879.  
and their application, (P.), B., 1021.  
on the fibre, (P.), B., 337, 978.  
from *p*-chlorophenylpyrazolones and  
anilines, (P.), B., 498.  
use of *antidiazotates* in, B., 593.  
from hydroxycarboxylic arylamides,  
(P.), B., 878.  
rearrangement of, into vat dyes, A., 265.  
chromability of, A., 1243.  
containing copper, manufacture of, (P.),  
B., 498.  
containing two hydroxyl groups, sul-  
phites of, A., 609.  
containing metals, manufacture of, (P.),  
B., 96, 254, 765, 834.  
containing sulphur, manufacture of, (P.),  
B., 498.  
from hydroxyquinolines, chromability of,  
A., 841.  
for acetate silk, manufacture of, (P.), B.,  
1115.  
for use as biological stains, preparation  
of, (P.), B., 58.  
for leather, manufacture of, (P.), B.,  
794, 834.  
for silk, manufacture of, (P.), B., 334.  
for wool, manufacture of, (P.), B., 176.  
acid, manufacture of, (P.), B., 176.  
blue to black, for cellulose ester materials,  
(P.), B., 302.  
chrome, manufacture of, (P.), B., 140,  
498, 765, 794.  
direct, manufacture of, (P.), B., 672,  
1021.  
black, manufacture of, (P.), B., 379.
- Azo-dyes, green, manufacture of, from  
amino-indigos and -thioindigos, (P.),  
B., 672.  
insoluble, manufacture of, (P.), B., 254,  
460, 794.  
on the fibre, (P.), B., 1026.  
green, manufacture of, (P.), B., 975.  
determination of diazotised intermedi-  
ates for, B., 1070.
- Azoimide (*hydrazoic acid*; *hydronitric acid*),  
reaction of, with carboxylic acids, A.,  
1030.  
with diazomethane, A., 1145.  
determination of, colorimetrically, A.,  
921.
- Azomethine, catalytic decomposition of,  
A., 478.
- 1:1'-Azonaphthalene, 2-hydroxy-, A., 155.
- 2:2'-Azonaphthalene-1:1'-disulphonic acid,  
derivatives of, A., 265.
- Azonaphthalene-4'-sulphonic acid, 2:7-di-  
hydroxy-, A., 264.
- Azopyridines, isomeric, A., 622.
- Azotemia, A., 1056.
- Azotobacter*, temperature of respiration of,  
A., 778.  
stimulation of growth of, by humic acid,  
B., 782.  
synthesis of ammonia by, A., 545.  
relations between denitrifiers and, B., 200.  
decomposition of nitrogen compounds  
and fixation of nitrogen by, A., 1169.  
influence of carbohydrates on pigment  
production of, A., 652.
- Azotobacter chroococcum*, gum production  
by, A., 93.
- o*-Azotoluene, crystal structure of, A., 327.
- p*-Azoxyanisole, anisotropy of, A., 677.
- 1-Azoxyanthraquinonesulphonic acids, sod-  
ium salts, A., 274.
- Azoxbenzene, 2:4:2':4'-tetrachloro-, A.,  
266.
- Azoxbenzenes, stereoisomerism of, A.,  
263, 734.
- Azoxo-compounds, reactions of, with benzyl  
alcohol, benzaldehyde, and quinoline,  
A., 155.
- 5:5'-Azoxo-*o*-coumaric acid, and its diethyl  
ester, A., 1243.
- 6:6'-Azoxycoumarin, A., 1243.
- $\beta$ -Azoxo- $\beta$ -methylbutan- $\gamma$ -one, A., 602.
- iso*Azoxytoluenes, A., 734.

## B.

- Babassu fat, detection of, in butter, B., 515.
- Babbitt metal, with tin base and low  
antimony and copper, B., 681.  
determination of lead in, volumetrically,  
B., 265.
- Bacilli, cholera, cyanogen in peptone  
water cultures of, A., 778.  
colon and typhoid, bactericidal action of  
silver on, A., 655.  
colon-aerogenes, cellobiose test for, A.,  
969.
- diphtheria, chemistry of, A., 94.
- dysentery, bacterial substances from, A.,  
430.
- leprosy, lipin fractions from, A., 307.
- timothy-grass, acetone-soluble fat of,  
A., 1290.  
phosphatide fraction of, A., 197.
- timothy-grass and tubercle, A., 969.
- tubercle, biology of, A., 653.  
specific carbohydrates of, A., 653.  
gas metabolism of, A., 779.
- lipins of, A., 197, 307, 1169, 1290.  
phosphatide from, A., 883.

- Bacilli**, tubercle, polysaccharides from, A., 883.  
 ultra-virus from, A., 431.  
 human, effect of lecithin and cholesterol on, A., 1067.  
 typhus-coli, nutrients for, A., 884.  
 Welch-Fraenkel, A., 1290.  
 Yersin's, bacteriophage lysing, A., 652.  
*Bacillus amylovorus*, control of, B., 908.  
*Bacillus anthracis*, *mesentericus* and *subtilis*, polysaccharides of, A., 545.  
*Bacillus cariocyanus*, growth of, in media, containing lithium, A., 779.  
*Bacillus coagulans*, A., 652.  
*Bacillus coli*, growth of, A., 545.  
 killing of, by ultra-violet light, A., 308.  
 effect of metals at a distance on, A., 1170.  
 viability of, in beer, B., 699.  
 lactose-fermenting, A., 653.  
 determination of, in water, B., 1106.  
*Bacillus coli typhosus*, fermentation by, A., 307.  
*Bacillus diphtheriae*, nucleic acid of, A., 779.  
*Bacillus fischeri*, effects of ammonia, fatty acids, and their salts on luminescence of, A., 1290.  
*Bacillus leprae*, phosphatide fraction of, A., 1169.  
*Bacillus paratyphosus* and *typhosus*, bacterial substances from, A., 430.  
*Bacillus phlei* and *tuberculosis*, properties of, A., 1067.  
*Bacillus prodigiosus*, formation of chymase by, A., 307.  
 red pigment of, A., 1043.  
*Bacillus pyocyaneus*, growth of, A., 196.  
 effect of composition of liquid media on, A., 93.  
*Bacillus subtilis*, acetylmethylcarbinol from degradation of sucrose by, A., 652.  
*Bacillus typhosus*, coagulation of milk by, A., 968.  
**Bacon**, gas storage of, B., 749.  
 influence of maize germ on quality of, B., 1053.  
**Bacteria**, fluorescence of, A., 430.  
 intake of dissolved substances by, A., 429.  
 $pH$  in absorption of dyes by, A., 652.  
 reaction regulators for cultures of, A., 652.  
 agglutination of, A., 430.  
 multiplication of, A., 306, 779.  
 effect of iron oxides on growth of, A., 431.  
 effect of metals at a distance on growth of, A., 778.  
 metabolism of, A., 653.  
 synergism of, A., 1290.  
 influence of dyes on formation of catalase by, A., 1067.  
 colouring matters of, A., 1043.  
 stability of emulsions of, A., 306.  
 transmissible lysozyme of, A., 307.  
 oxidation of manganese by, A., 307.  
 reduction of nitrates by, A., 429.  
 assimilation of atmospheric nitrogen by, A., 306.  
 phosphorus distribution in, A., 196.  
 porphyrins from, A., 969.  
 protease of, A., 429.  
 stability of physiological characters of, A., 968.  
 antagonism of, and bacteriophage, A., 654.  
 compounds lethal to, A., 778.  
 growth of, in butter, B., 45.  
 in coal seams, A., 1067.  
 in salted fish, B., 655.  
 counting of, in water, B., 50.
- Bacteria**, growth of, in water, B., 754.  
 derivatives from, A., 883.  
 Gram staining of, A., 1170.  
 acetic, A., 883.  
 fermentation by, A., 94.  
 anaerobic respiration experiments with, A., 93.  
 degradation of methyl alcohol, formaldehyde, and formic acid by, A., 1289.  
 decomposition of lactic and pyruvic acids by, A., 545.  
 killed, oxidases of, A., 1289.  
 acid-fast, action of organic acids on, A., 883.  
 proteins from filtrates of, A., 198.  
 differential stain for, A., 198.  
 aerobic, oxygen optimum and media for, A., 883.  
 agar-digesting, A., 1289.  
 anaerobic, cultivation of, A., 431.  
 reduced iron for, A., 1067.  
 thermophilic, B., 285.  
 autotrophic, oxidation of ammonia and decomposition of petroleum by, A., 429.  
 beriberi, decomposition of sugars by, A., 1290.  
 coal, A., 360.  
 food-poisoning, B., 369.  
 Gram-negative and -positive, action of distilled water and heavy metal salts on, A., 198.  
 hemicellulose-splitting, A., 1066.  
 lactic, mutase and glycolase of, A., 307.  
 nitrogen requirements of, A., 1169.  
 respiration of, A., 654.  
 effect of associated growth on, A., 883, 1066.  
 effect of yeast on growth and properties of, A., 653.  
 fermentation of hexoses by, A., 195.  
 inhibition of fermentation by, by halogeno-aliphatic acids, A., 654.  
 lime-precipitating, from the Sevan Lake, A., 594.  
 luminous, biochemistry of, A., 652, 1065.  
 manganese, in waters of Texas, A., 307.  
 nitrogen-fixing, respiration of, A., 1067.  
 phytopathogenic, fluorescence of, A., 884.  
 propionic, A., 654, 1066.  
 "resting," A., 198.  
 root-nodule, effect of soil bacteria on growth of, A., 196.  
 soil, agar media for counting of, A., 94.  
 in relation to germination of plants, A., 437.  
 liberation of nitrogen by, A., 196.  
 nitrogen metabolism of, A., 1066.  
 decomposition of pentosans by, A., 429.  
 sulphur, green and purple, A., 884.  
 thermophilic, action of, on coal, A., 307.  
**Bactericides**, B., 907.  
 vapours from irradiated oils as, B., 962.  
**Bacteriophage** from root nodule bacteria, A., 883, 1291.  
 from plague patients, A., 652.  
 purification of, A., 1291.  
 properties of, A., 545.  
 adsorption and elution of, A., 94.  
 adsorption of, by silicic acid, A., 17.  
 and bacterial antagonism, A., 654.  
 antistaphylococcus, heat-inactivation of, A., 545.  
**Bacteriophagy**, A., 969.  
**Bacteriospores**, biochemistry of, A., 1170.  
*Bacterium Bordeaux*, enzymic action of, A., 1169.  
*Bacterium Delbrücki*, conversion of lactic acid into pyruvic acid by, A., 429.
- Badan**, B., 1045.  
 cultivation of, in Central Europe, B., 741.  
**Baeyer-Drewson reaction**, A., 510.  
**Bagasse**, manufacture of paper pulp from, (P.), B., 595.  
 production of pulp and extraction of cellulose from, (P.), B., 501.  
 treatment of, for making wallboard, (P.), B., 1075.  
 testing of, B., 1003.  
**Bagtikan trees**, Philippine, analysis of sections of, A., 550.  
**Baicalinase**, A., 650.  
**Bakelite** from shale oil, B., 356.  
 ointment jars of, B., 234.  
**Bakelite materials**, B., 1091.  
**Bakery products**, production of, (P.), B., 1006.  
 material for filling or icing of, (P.), B., 785.  
**Baking**, acidifying agent for use in, (P.), B., 1006.  
 shortening composition for, (P.), B., 784.  
 analyses of ingredients used in, B., 283.  
 detection of powders used in, B., 574.  
**Baking powder**, (P.), B., 912.  
 calcium lactate in, B., 445.  
 detection of, B., 860.  
**Baking tests**, evaluation of, B., 398.  
 separation of diastatic activity from strength in, B., 481.  
**Balakat wood**, composition of, B., 385.  
**Balakat-gubat wood**, composition of, B., 385.  
**Balances**, air dryer for, A., 358.  
 air-, oil-, or magnetic damping for, A., 925.  
 analytical, (P.), B., 869.  
 micro-, A., 358, 1106.  
 electromagnetic, A., 37.  
*Balaninus dentipes*, reserve fat of, A., 1275.  
*Balanus balanoides*. See Barnacles, rock.  
**Balata**, B., 32.  
 heat-treatment and polymorphism of, B., 949.  
 oxidation of, A., 398; B., 315.  
 production of compositions from resins in, (P.), B., 689.  
 insulating material from, (P.), B., 739.  
 leather substitute from, (P.), B., 437.  
 porous, production of, (P.), B., 476.  
 determination in, of moisture, nephelometrically, B., 563.  
**Balls**, golf, manufacture of plastic centres for, (P.), B., 72.  
**Ball bearings**. See under Bearings.  
**Balloon fabrics**, production of, (P.), B., 722.  
 gasproof, (P.), B., 675.  
**Balobo wood**, Philippine, composition of, B., 773.  
**Balsam**, copaiba, detection of, B., 687.  
 Peru, tests for purity of, B., 1135.  
**Bamboo**, chemistry of, B., 1022.  
 Bamboo pulp, unbleached, beating characteristics of, B., 1073.  
**Banai-banai wood**, Philippine, composition of, B., 773.  
**Bananas**, ripening and transport of, in Australia, B., 856.  
 effect of ethylene on ripening of, B., 362.  
**Banti's disease**, artificial, A., 80.  
**Barbaloin**, constitution of, and its derivatives, A., 516, 1252.  
**Barbatic acid**, constitution of, and its ethyl ester, A., 850.  
**Barbatol**, and its derivatives, A., 61.  
**Barbatolic acid**, and its constitution and derivatives, A., 60.  
**Barbatorin**, and its derivatives, A., 61.

**Barbituric acid**, derivatives, hypnotic action of, A., 540.  
 detection of, toxicologically, A., 773.  
*N*-substituted derivatives of, A., 283, 951.  
 analysis of narcotics containing, B., 750.  
**Barbituric acid**, dibromo-, reaction of, with amines, A., 523.  
**Barbituric acids** from petroleum, A., 1262.  
 production of soluble salts of, (P.), B., 482.  
**Barbituric acids**, dihalogeno-, reactions of, A., 283.  
**Barium**, isotopic constitution and atomic weight of, A., 209.  
 allotropy of, A., 115.  
 production of, B., 145.  
 in closed vessels, (P.), B., 232.  
 arc and spark spectra of, A., 979.  
 nuclear moment from spectrum of, A., 979.  
 superconductivity of, A., 683.  
 radioactive decomposition of, A., 981.  
 action of carbon dioxide on, A., 1217.  
**Barium salts**, containing radium, structure and emanation of, A., 1217.  
**Barium aluminate**, manufacture of, (P.), B., 841.  
 bromate, crystallo-luminescence of, A., 983.  
 carbonate, crystal structure of, A., 12.  
 burning of, to oxide, (P.), B., 181.  
 regeneration of, B., 100.  
 chloride, conductivity of, in sucrose solution, A., 1206.  
 ionic activity and dissociation of water in solutions of, A., 997.  
 electrolytic water transport in solutions of, A., 575.  
 activity coefficient of, A., 1089.  
 adsorption on vacuum-sublimed films of, and determination of specific surface, A., 224.  
 density and partial molal volume of ammonia in amines of, A., 113.  
 sublimed, adsorption of iodine on, A., 17.  
 chloride and nitrate, crystalline, and their saturated solutions, distribution of radium and radium-*D* between, A., 1198.  
 fluoride, absorption and emission spectra of, A., 557.  
 hydride, spectrum of, A., 104, 439.  
 band spectrum of, A., 315.  
 hydroxide, production of, (P.), B., 340.  
 from the sulphide, (P.), B., 340.  
 activity coefficient of, in aqueous solution, A., 696.  
 solubility of, in dilute sodium hydroxide solutions, A., 1198.  
 equilibria of, with phosphoric acid, carbon dioxide and water, A., 229.  
 interfacial tension between benzene solutions of palmitic acid and solutions of, A., 1200.  
 trihydrate, crystal structure of, A., 218.  
 iodide, adsorption of iodine and nitrophenol by films of, A., 689.  
 nitrate, heat of dilution of, A., 23, 913.  
 oxide, production of, in tunnel ovens, (P.), B., 145.  
 electrical conductivity and electron emission of, A., 1077.  
 peroxide, formation of, A., 27.  
 silicates, formation of, from barium carbonate and silicic acid, A., 125.  
 sulphate, of definite granule size, manufacture of, (P.), B., 261.  
 reaction of, with alumina at high temperature, A., 482.  
 precipitation of, in presence of thorium and uranium, A., 1011.  
 precipitated, composition of, A., 922.  
 sulphide, phosphorescence of, A., 1216.

**Barium detection and determination** :—  
 detection of, A., 489.  
 determination of, as chromate, A., 589.  
 micro-chemically, A., 922.  
 in ferriferrous minerals, A., 588.  
**Bark**, chemistry of, A., 663.  
 non-tans in, B., 157.  
 utilisation of, as fuel, B., 918.  
 pine. See Pine bark.  
 wattle. See Wattle bark.  
 determination in, of tannin, B., 564.  
**Barkhausen effect**, A., 327, 987.  
 effect of gases on, A., 904.  
 internal, A., 1080.  
**Barley**, influence of electrical treatment on germination of, B., 75.  
 effect of nitrogenous fertilisers on, B., 123.  
 steeping of, and the so-called saturation point, B., 699.  
 kiln-drying of, B., 699.  
 malting of, B., 699, 746.  
 effect of potash on "lodging" of, A., 204.  
 effect of potash manuring on growth and mechanical properties of straw of, B., 1096.  
 effect of potash deficiency on respiration of, A., 660.  
 relation of amounts of large and small starch granules to protein content of, B., 320.  
 amylase of, A., 303, 649.  
 effect of starch concentration on hydrolysis by, A., 1286.  
 catalase in, A., 550.  
 formation of chlorophyll in roots of, A., 660.  
 spectroscopy of alcohol extracts of leaves of chlorophyll-mutants of, A., 785.  
 mutants of, A., 550.  
 proteins, changes in, on storage and sprouting, A., 312.  
 tannins in husks of, B., 858.  
 antirachitic vitamin in radicles of, A., 98.  
 prediction of malt extract of, by Bishop's formula, B., 654.  
 manganese-deficiency disease of, B., 569.  
 development of loose smut in, and its control with dust fungicides, B., 697.  
 germinating, germ of, B., 784.  
 malting, phosphate fertilisers for, B., 1046.  
 spring, influence of potash manuring on germinative ripening and catalase activity of, B., 317.  
 summer, effect of potash on root development in, B., 441.  
 Swedish brewing, catalase in, B., 364.  
 analysis of husks of, B., 42, 43.  
 detection of, in wheat flour, B., 239.  
**Barley flour**, detection of, in rye and wheat flours, B., 1004.  
**Barnacles**, rock, stimulation of, by salts of fatty acids, A., 963.  
**Barytes**, crystal formation of, A., 247.  
 vicinal faces on, A., 450.  
 breaking up of, (P.), B., 885.  
 decolorisation of, (P.), B., 981.  
 See also Barium sulphate.  
**Basalt**, manufacture of articles from, (P.), B., 182.  
**Base**,  $C_8H_8H_4$ , and its salts, from reduction of 4-nitro-5-(3-pyridyl)pyrazole, A., 68.  
 $C_8H_7O_3$ , from acetylation of protein, fission of glyoxaline ring in, A., 625.  
 $C_{10}H_{14}O_2N_2$ , constitution of, A., 624.  
 $C_{12}H_9ON_3$ , from nitrobenzene, ammonia, and sodamide, A., 622.  
 $C_{13}H_{23}N$ , and its picrate, from hydrogenation of 2-methylcyclohexanone, A., 156.

**Base**,  $C_{26}H_{19}O_4N$ , and its hydride, from palmatine, A., 177.  
 $C_{33}H_{27}O_3N$ , from hexamethylenetetramine and naphthols, A., 266.  
**Bases**, conductivity of, in sucrose solution, A., 1206.  
 asymmetric, affinity between acids and, A., 1089.  
 organic, relation between structure and strength of, A., 1089.  
 use of Reinecke's acid in detection and determination of, A., 1118.  
 primary and tertiary, interaction of, with  $\omega$ -halogenoacetophenones, A., 744, 1241.  
 secondary, recovery of, from nitrosoamines, A., 375.  
 determination of, by precipitation with *m*-bromopicrolic acid, A., 523.  
 $\psi$ -Bases, A., 169.  
**Base-exchange substances**, (P.), B., 103.  
 manufacture of, (P.), B., 421, 935.  
 stabilisation of, (P.), B., 103.  
 removal of excess alkalinity from, (P.), B., 770.  
**Bass**, black large-mouth, arsenic content of, A., 1275.  
**Bates**, evaluation of, by Löhlein-Volhard method, B., 810.  
**Bating**, B., 904.  
 with mixtures of enzymes from fish intestines, B., 393.  
**Batteries**, (P.), B., 734, 898.  
 electrodes for, (P.), B., 352.  
 determination of depolarising power of pyrolysate used in, B., 558.  
 for pocket-lamps, B., 943.  
 dry, (P.), B., 115.  
 non-crumbling cores for, (P.), B., 647.  
 galvanic, (P.), B., 993.  
 insulation of cells in, (P.), B., 611.  
 high-tension, insulation of cells of, (P.), B., 268.  
 primary, (P.), B., 558, 897.  
 ammonium persulphate as depolariser for, B., 775.  
 air depolarised, (P.), B., 352.  
 primary and secondary, rubber separators for, (P.), B., 433.  
 storage, (P.), B., 113.  
 with soluble electrodes, purification of electrolyte of, (P.), B., 514.  
 iron electrodes for, (P.), B., 1038.  
 protection of grids of, (P.), B., 732.  
 plates for, (P.), B., 432.  
 prevention of buckling of, (P.), B., 433.  
 lead suboxide paste for, (P.), B., 69.  
 separators for, (P.), B., 432.  
 alkaline, (P.), B., 432.  
 lead, (P.), B., 898.  
 under high pressure, B., 645.  
**Bauxite**, treatment of, (P.), B., 305.  
 from Gorizia, A., 248.  
 Hungarian, flotation of, B., 546.  
**Beans**, effect of  $pH$  of soil on growth of, and its susceptibility to dry root rot, B., 568.  
 arsenicals for control of Mexican bean beetle in, B., 813.  
 cacao. See Cacao beans.  
 calabar. See Calabar beans.  
 coffee. See Coffee beans.  
 jack-, preparation of meal from, A., 650.  
 navy, as source of calcium, nitrogen, and phosphorus in diet, A., 1060.  
 lipoxidase of, A., 967.  
 soya. See Soya beans.  
**Bean weevils**. See under Weevils.  
**Bearings**, anti-friction, (P.), B., 455.  
 ball, of stainless steel, B., 643.  
**Beckmann rearrangement**, A., 386, 387.

- Becquerel effect, A., 581.
- Bees, fertility of, and vitamin-E, A., 1295.  
honey, changes in nectar concentration produced by, B., 815.
- Bee resin. See Propolis.
- Beech, red, sap of, A., 204.
- Beef, period of ageing of, to produce tender quick-frozen meat, B., 1005.  
chilled and quick-frozen, relative tenderness of, B., 815.
- Beer, manufacture of, (P.), B., 365.  
removal of alcohol from, (P.), B., 620, 814.  
removal of immature odoriferous constituents from, (P.), B., 859.  
colouring of, (P.), B., 365.  
roasting of malt for, B., 43.  
foam on, B., 859, 958.  
metabolism of yeasts in relation to fermentation of, B., 43.  
deposition of calcium oxalate in, B., 958.  
adsorption of proteins in, by various media, B., 43.  
protein haze in, B., 859.  
protein-tannin compounds during fermentation and storage of, B., 524.  
prevention of formation of unpleasant tastes in, (P.), B., 1133.  
food value of, B., 321.  
viability of *B. coli* in, B., 699.  
bottled, preserving taste of, by treatment of bottles, (P.), B., 1004.  
draught, preparation of, for sale, (P.), B., 747.  
malt, determination of, of dextrin, B., 957.  
vitamin-containing, manufacture of, (P.), B., 365, 444, 525.  
calculation of extract in original wort in analysis of, B., 1004.  
determination of degree of fermentation of, B., 1133.  
electrometric titration of, B., 525.  
determination of pH of, colorimetrically, B., 397.  
determination in, of dextrin, by ultra-filtration, B., 783.  
of saccharin, B., 399.  
of sucrose, B., 43, 364.  
of sulphurous acid, B., 204.
- Beetles, Asiatic and Japanese, control of larvæ of, in lawns and golf courses, B., 1048.
- bean, control of, in Mexico, B., 813.  
in New Mexico, B., 570.  
carpet, fumigation of, with ethylene dichloride and carbon tetrachloride, B., 578.
- cucumber, striped and spotted, control of, B., 813.
- dermestid, nutrition of, A., 1275.
- flour. See *Tribolium confusum*.
- Japanese. See *Popillia japonica*.
- raspberry, control of, by means of *Deris*, B., 523.
- Beetroots, sugar, effects of seed treatments on germination and yield of, B., 855.  
presses for, B., 1003.  
drying of, B., 40, 857.  
dried, colloids in juice of, B., 698.  
drying of cossettes of, (P.), B., 745.  
extraction of juice from dried cossettes of, by cold diffusion, B., 1003.  
extraction of sugar from dried cossettes of, (P.), B., 1100.  
"plus-sugar", from cossettes of, B., 1048.  
transport and storage of desiccated cossettes of, (P.), B., 1050.  
marc of, B., 125, 279, 1003.
- Beetroots, sugar, pulp, thermophilic fermentation of, A., 1066.  
slices, continuous diffusion of, B., 159.  
pressed, dry substance of, B., 478.  
size and shape of plot for field experiments on, B., 697.  
growth and nutrient intake of, during first and second years of growth, B., 811.  
effect of carbon dioxide increase on growth of, B., 123.  
fertilisers for, B., 568.  
time of application of fertilisers for, B., 123.  
"Karbohumate" as a fertiliser for, B., 744.  
influence of potash dressings on growth and quality of, B., 277.  
effect of potassium salts on, B., 568.  
influence of soil and climatic conditions and of fertilisers on yield of sugar from, B., 1002.  
reserve nitrogen in soils after cropping with, B., 362.  
effect of stripping of leaves of, on purity of juice, B., 908.  
activity of amylase in leaves of, A., 1063.  
non-sugars in, B., 238.  
productivity and sugar content of, A., 437.  
nutrient value of, B., 205.  
feeding stuff for calves from, B., 445.  
use of leaves of, as a feeding-stuff, B., 206.  
feeding value of leaves of, for milch cows, A., 86.  
changes in nitrogen compounds of, during storage, B., 1097.  
decay of, by *Phoma betæ*, B., 523.  
sampling of, B., 697.  
specification for, and their testing, B., 478.  
determination of sugar in Steffen slices of, B., 908.
- Behenic acid,  $\alpha$ - and  $\beta$ -octabromides of, A., 1233.
- Belladonna extracts, dry, determination in, of alkaloids, B., 400.
- Belt for conveyors, etc., (P.), B., 460.
- Bentonite, true density of, A., 1085.  
colloidal properties of suspensions of, A., 461, 806.  
base-exchange reactions of, A., 459.  
montmorillonite in, A., 1228.  
North Dakota, properties of, B., 23.
- Benzaldazine, thermal decomposition of, A., 1262.
- Benzaldehyde, absorption of oxygen by, A., 818.  
ozonisation of, A., 235, 1095, 1212.  
effect of substituents in condensations of, A., 513.  
reaction of, with azo- and azoxy-compounds, A., 155.  
with its phenylmethylhydrazine and hydrochloric acid, A., 51.  
with quinoline, A., 1261.  
dimethylacetal, *p*-chloro-, A., 1132.  
*dl*-nor- $\beta$ -ephedrineformylhydrazine, A., 736.  
*p*-nitrophenylsemicarbazone, A., 598.  
phenylhydrazine and *p*-nitrophenylhydrazine, *p*-chloro- $\alpha$ -nitro-, A., 939.  
phenylmethylhydrazine, and *m*-nitro-, compounds of, with benzaldehyde and *m*-nitrobenzaldehyde, A., 1132.  
sodium hydrogen sulphite, rate of dissociation of, A., 818.  
 $\alpha$ -sulphonyl fluoride, and its 2:4-dinitrophenylhydrazine, A., 940.
- Benzaldehyde,  $\alpha$ -amino-, condensation of, with homophthalimide, A., 1145.  
 $\alpha$ -amino- and  $\alpha$ -nitro-, condensation products, with 5:5-dimethylhydroresorcinol, A., 403.  
*m*-bromo-, *p*-nitrophenylhydrazine and semicarbazone, and *m*-chloro-, *m*-iodo-, and *m*-nitro-, *p*-nitrophenylhydrazones, A., 384.  
*p*-bromo- and chloro-, autoxidation of, A., 615.  
3-bromo-4-hydroxy-, semicarbazone, A., 946.  
2-chloro-6-fluoro-, and its semicarbazone, A., 55.  
2:3:4:5-tetrahydroxy-, A., 858.
- Benzaldehydes, bromo- and chloro-, effect of constitution on derivatives of, A., 1249.  
hydroxy-, 2:4-dinitrophenyl ethers of, A., 513.  
 $\alpha$ -hydroxy-, sodium salts, chelation in, A., 513.  
nitro-, reduction of, A., 513.  
 $\alpha$ -nitro-, condensation of, with aromatic hydrocarbons, A., 169.
- Benzaldoximes, 2:6-dichloro-3-amino- and -3-nitro-, and their derivatives, A., 743.  
nitro-, salts of, A., 160.
- Benzamide, preparation of, in liquid ammonia, A., 1122.
- Benzamide, 3-nitro-4-hydroxy-, manufacture of derivatives of, (P.), B., 174.
- Benzamide-*p*-thioarsinic acid, esters of, A., 70.
- Benzamidines, amino- and hydroxy-, and their salts, A., 55.
- Benzanilide imidochloride, *p*-bromo- and  $\alpha$ -chloro-, A., 386.
- Benzanilide, *p*-amino-, *p*-amino- and *p*-hydroxy-thio-, and *di*- and *tri*-hydroxy-thio-, A., 511.
- Benzanilides, condensation of, with *p*-dialkylanilines, in presence of phosphoryl chloride, A., 386.
- Benzanilide-*pp'*-distibinous oxide, A., 867.
- 1:2-Benzanthracene, A., 374.
- 9:10-*endo*-Benzanthracene- $\alpha\beta$ -succinic anhydrides, A., 608.
- 1:2-Benzanthraquinone, synthesis of, by thermal dehydration of  $\alpha$ - $\alpha$ -naphthoylbenzoic acid, A., 1252.
- Bz*-1:2-Benzanthraquinone, 4-bromo-, A., 1030.
- 1:2-Benzanthraquinones, manufacture of, (P.), B., 333, 928.
- Benzanthraquinone dyes, vat, manufacture of, (P.), B., 333.
- 1:2-Benzanthraquinone dyes, vat, manufacture of, (P.), B., 333.
- Benzanthrene, preparation of 2:3-trimethylene-4:5-dihydronaphthalene-6:7-dicarboxylic anhydride from, A., 1131.
- Benzanthrone, constitution of, A., 731, 1134.  
production of, (P.), B., 460.  
derivatives, manufacture and use of, (P.), B., 592.
- Benzanthrone dyes, and their intermediates, manufacture of, (P.), B., 175.  
vat, manufacture of, (P.), B., 333.  
and their intermediates, (P.), B., 175.
- Benzanthrone-pyrazolanthrone dyes, vat, manufacture of, (P.), B., 254.
- Benzanthroneylaminoanthraquinones, vat dyes from (P.), B., 333.
- Benz-*p*-arsenious hydroxyiodide, A., 528.
- Benz-*p*-arsinic acid, A., 528.
- 4-Benzarsinic acid, 3-nitro-, acid potassium salt, A., 180.

- 2:3-Benzcarbazole-1:4-quinone**, 6-bromo-, and 6-chloro- and its acetate, and 2'-hydroxy-, A., 265.
- 2:3-Benzcarbazole-1:4-quinone-3'-sulphonic acid**, A., 265.
- Benz-3:5-dichloroanilide**, and its imino-chloride, A., 846.
- 1:3-Benzodioxin**, and 6-amino-, and its acetyl derivative, and 6-bromo-, A., 949.
- Benzene nucleus**, structure of, A., 904.
- orienting influences in, A., 738.
- directive influence of mono- and dialkylsulphonamido-groups in, A., 940.
- primary additive products in indirect substitution in, A., 52.
- velocity measurements in relation to substitution in, A., 127.
- internal molecular potential between substituted groups in, A., 21.
- transpositions in, A., 732.
- comparison of heterocyclic systems with, A., 170.
- allotropy of, A., 452.
- production of, from coal tars and oils, (P.), B., 634.
- removal of sulphur from, by hydrogenation, B., 246.
- distillation of, with methyl alcohol and water, A., 687.
- refractive index of, during intensive drying, A., 323.
- refractivities and partial pressures of binary mixtures of, with its polar derivatives, A., 1197.
- induced polarities in, A., 795, 1078.
- absorption spectrum of, A., 6, 1075.
- and dichloro-derivatives, effect of temperature on ultra-violet absorption spectra of, A., 674.
- Raman spectrum of, A., 7, 109, 320, 675.
- vapour, fluorescence spectrum of, A., 558.
- resonance fluorescence of, A., 1189.
- scattering of X-rays and cathode rays in, A., 1078.
- electrostriction of, A., 565.
- ionisation of, by electron impact, A., 983.
- vapour, ionisation in, A., 793.
- m. p. of, A., 1081.
- and nitro-, cryoscopic use of, A., 18.
- ebullioscopy with, A., 804.
- isotherms for binary mixtures of, with methyl and propyl alcohols, A., 330.
- activated adsorption of, A., 688.
- vapour, expansion of charcoal by, A., 1199.
- surface tension of mixtures of, with propyl alcohol, A., 330.
- solubility of picric acid in mixtures of alcohols with, A., 458.
- crystal structure of, A., 451.
- equilibrium of, with alcohol and water, A., 801.
- with allylthiocarbimide and aniline, A., 913.
- with diphenyl, diphenylbenzene, and hydrogen, A., 1203.
- with hydrogen and diphenyl, A., 1203.
- with hydrogen and hexahydrobenzene, A., 1203.
- with toluene and with *m*-xylene, A., 1083.
- velocity of sound of, in *n*-heptane, A., 683.
- photochemical reaction of, with chlorine, A., 349.
- thermal vapour-phase chlorination of, A., 152.
- fluorination of, A., 142.
- sulphonation of, B., 137.
- Benzene**, condensation of, with  $\alpha\beta$ -dibromocarboxylic acids, A., 382.
- with esters, in presence of aluminium and thallium trichlorides, A., 1240.
- compounds of, with picryl chloride and with *s*-trinitrobenzene, A., 697.
- derivatives, dipole moments of, A., 984.
- direction of carbon valencies in, A., 942.
- substituted derivatives, Raman spectra of, A., 213, 898.
- homologues, synthesis of, by Friedel-Crafts reaction, A., 373.
- displacement of, from oil-bearing sands by aqueous solutions, B., 455.
- transport of, during winter in tank cars, B., 968.
- content of, in blood, after administration, A., 87.
- effect of, on antibody formation, A., 1060.
- determination of, in air, B., 536, 625.
- in motor fuels, B., 297.
- in mixed solvents, B., 1065.
- in water, B., 298.
- determination in, of carbon disulphide, B., 711.
- See also Benzene and Benzol.
- Benzene**, bromo-, effect of administration of, on excretion of sulphur, A., 300.
- chloro-derivatives, absorption spectra of, A., 1188.
- chloro-, manufacture of, (P.), B., 332.
- m*-dichloro-, action of sodium methoxide on derivatives of, and 2:4-dichlorofluoro-, A., 266.
- chlorobromo-derivatives, dipole moments of, A., 984.
- mono*- and *di*-chlorohalogenodinitro-derivatives, A., 734.
- chlorodinitro-, action of sodium hydroxide on, B., 12.
- 1-chloro-2:4-dinitro-, use of, in identification of mercaptans, A., 719.
- 4:6-dichloro-1:3-dinitro-, molecular compounds, with organic compounds, A., 259.
- halogenonitro-derivatives, electric moments of, A., 9.
- 1-halogeno-2:4-dinitro-derivatives, electric moments of, A., 794.
- di*hydroxy-derivatives, solubilities of, A., 118.
- reaction of, with cyanogen, A., 1245.
- compounds of, with styphnic acid, A., 942.
- iodo-, dichloride, decomposition of, A., 1120.
- reaction of, with sodium ethylmercaptide, A., 1120.
- nitro-derivatives, compound formation between, A., 153, 228.
- nitro-, optical properties of, A., 448.
- molecular refraction of, A., 447.
- absorption spectra of, in liquid and gaseous states, A., 444.
- effect of electric field on X-ray diffraction pattern of, A., 12.
- Kerr's law for, in strong alternating electric fields, A., 111.
- Kerr constant of, A., 561.
- dielectric constant and density of, A., 1190.
- homogeneity of, A., 905.
- two liquid states of, A., 329.
- liquid and solid, dielectric constant of, A., 899.
- viscosity of, A., 1081.
- equilibrium of, with sulphuric acid and water, A., 698.
- Benzene**, nitro-, electrolytic reduction of, to azoxybenzene, A., 1005.
- to *p*-aminophenol, B., 112.
- photochemical interaction of toluene and, A., 130.
- compound of, with sulphuric acid, A., 152.
- detection of, A., 1240.
- mono*- and *m*-*di*-nitro-, compound of, A., 939.
- dinitro*-derivatives, electrolytic reduction potentials of, A., 231.
- isomeric, A., 259.
- thermal analysis of mixtures of, A., 574, 810.
- m*-dinitro-, crystal structure of, A., 327.
- s*-trinitro-, crystal structure of, A., 114.
- nitroso-, reaction of, with phenylcarbylamine, A., 403.
- attempted preparation of thio-oxide of, A., 1121.
- Benzene**arsinic-stibinic acids, manufacture of bismuth compounds of, (P.), B., 129.
- Benzene**azooacetoacetic acid, *di*bromo-,  $\gamma$ -bromo-*p*-bromo-,  $\gamma\gamma$ -*di*bromo-*di*bromo-, and *di*chloro-, *mono*- and *di*-chloro-, and  $\gamma$ -chloro-*mono*- and *di*-chloro-, ethyl esters, A., 1125.
- $\gamma\gamma$ -*di*bromo-*p*-bromo-, and its ethyl ester, A., 1125.
- 2:4:6-*tri*bromo- and 2:4:6-*tri*chloro-, ethyl esters, and their acetyl derivatives, A., 377.
- Benzene**azo-2:6-diaminopyridines, manufacture of, (P.), B., 1008.
- 3-(Benzeneazobenzene)-1:3-dihydrophthalazine-4-acetic acid**, 1-hydroxy- and 1-hydroxy-3:4'-nitro-, and their derivatives, A., 755.
- 3-(Benzeneazobenzene)-1:3-dihydrophthalazine-1-sulphonic-4-acetic acid**, and 3:4'-nitro-, sodium hydrogen salts, A., 755.
- Benzene**azo- $\gamma$ -*mono*- and  $\gamma\gamma$ -*di*-bromoacetoacetic acids, 2:4:6-*tri*bromo- and 2:4:6-*tri*chloro-, ethyl esters, A., 377.
- Benzene**azocarbonanilide, *tri*bromo-derivative, A., 1026.
- 4-Benzeneazofluoran**, 1:6-*di*hydroxy-, A., 266.
- Benzene**azofluorescein, and *p*-nitro-, and their diacetyl derivatives, A., 1141.
- Benzene**azo-4-hydroxy-3-methyldiphenyl, A., 1124.
- 3-Benzeneazo-2:4-dihydroxyquinolines**, chloro- and nitro-, A., 623.
- $\beta$ -Benzeneazonaphthalene, A., 265.
- 1-Benzeneazonaphthalene-3-carboxylic acid**, 2-hydroxy-, derivatives of, A., 265.
- $\beta$ -Benzeneazonaphthalene-1-sulphonic acid, sodium salt, A., 265.
- Benzene**azo- $\beta$ -naphthol-4':6-disulphonic acid, derivatives of, A., 264.
- Benzene**azo- $\beta$ -naphtholsulphonic acids, and *p*-amino- and *p*-hydroxy-, derivatives of, A., 264, 265.
- Benzene**azo- $\beta$ -naphthylamine, reaction of, with ethyl acetoacetate, A., 952.
- 4-Benzeneazo-1-naphthylarsinic acid**, A., 409.
- 4-Benzeneazo-N-naphthylhomophthalimides**, A., 624.
- Benzene**azotrinitromethane, and its derivatives, A., 1146.
- Benzene**-6-azo-*p*-phenylarsinic acid, 1:3-*di*-hydroxy-, salts of, A., 528.
- 4-Benzeneazo-N-phenylhomophthalimide**, A., 624.
- 5-Benzeneazo-1-phenyltetrazole**, A., 1044.
- 5-Benzeneazo-6-retenol**, 5-*p*-nitro-, A., 165.

- 4-Benzeneazo-3-*p*-tolueneazotoluene, A., 264.
- 4-Benzeneazo-*N*-*p*-tolylhomophthalimide, A., 624.
- Benzeneazotriacetic acid, A., 748.
- Benzeneazoxycarbouamide, *p*-chloro-, and its azo- $\beta$ -naphthol derivative, A., 1026.
- Benzeneazoxycarbonanilide, and its derivatives, A., 1026.
- Benzene- $\gamma$ -chloroacetoacetic acid, 2:4:6-*tri*-bromo- and 2:4:6-*tri*-chloro-, ethyl esters, A., 377.
- Benzenediazonium chloride, decomposition of, in aqueous solution, A., 704.
- 3-Benzenehomophthalimides, chloro- and nitro-, A., 623.
- Benzenesulphonhydrazides, nitro-, and their derivatives, A., 373.
- Benzenesulphonic acid, 2:4:6-*tri*-bromo-, sodium salt, A., 940.
- 2-chloro-5-amino- and -5-nitro-, and 2-iodo-5-nitro-, derivatives of, A., 942.
- Benzenesulphonphenylhydrazide, 4-chloro-2-nitro- and *p*-nitro-, A., 374.
- Benzenesulphonyl bromide, *o*-nitro-, A., 1023.
- fluoride, *o*-cyano- and *o*-nitro-, A., 940.
- Benzenesulphonylacetone, chloro-, A., 838.
- 8-Benzeneulphonylaminoquinoline, A., 1040.
- 8-Benzeneulphonylbenzylaminoquinoline, and its methosulphate, A., 1040.
- 1-Benzeneulphonyl-3:2-*o*-benzylene-3-ethylindoline, 2-hydroxy-, A., 1261.
- Benzenesulphonyldi(methanesulphonyl)-methane, A., 838.
- 4-Benzeneulphonyl-2:3-dimethyl- $\beta$ -methylglucoside, and its 6-nitrate, and 6-iodo-, A., 254.
- 8-Benzeneulphonylethylamino-1-ethylquinolinium salts, optically active, A., 1040.
- 8-Benzeneulphonylethylamino-1-methylquinolinium salts, A., 1040.
- 8-Benzeneulphonylethylaminoquinoline, A., 1040.
- Benzenesulphonylguanidines, and their derivatives, A., 727.
- $\alpha$ -Benzenesulphonyl- $\alpha$ -methylthiolacetic acid, ethyl ester, A., 838.
- $\alpha$ -Benzenesulphonyl- $\alpha$ -methylthiolacetone, A., 837.
- Benzenesulphonylmethylthiomethane, and *p*-chloro-, A., 837.
- $\alpha$ -Benzenesulphonyl- $\alpha$ -phenylthiolacetone, A., 838.
- 8-Benzeneulphonyl-*n*-propylaminoquinoline, and its derivatives, A., 1040.
- Benzenethiolsulphonic acid, methyl ester, A., 837.
- Benzenethiolsulphonic acid, 3:5-*d*-nitro-, phenyl ester, A., 940.
- Benzene-1:3:5-*tri*-*o*-thiobenzoic acid, A., 1259.
- Benzene-1:3:5-*tri*- $\beta$ -thiopropionic acid, A., 1259.
- Benzhydrol, reaction of, with thiophenols, A., 1027.
- Benzhydryl rule, A., 838.
- Benzhydryl-*p*-bromophenylacetylene,  $\alpha$ -amino-, and its hydrochloride, A., 260.
- Benzhydryl- $\beta$ -naphthylacetylene,  $\alpha$ -amino-, and its hydrochloride, A., 260.
- Benzhydrylphenylacetylene,  $\alpha$ -amino-, and its hydrochloride, A., 260.
- p*-Benzhydryltetraphenylmethane, formation of, by action of sodium triphenylmethyl on inulin, A., 934.
- Benzhydryl-*p*-tolylacetylene,  $\alpha$ -amino-, and its hydrochloride, A., 260.
- Benzidine, production of, (P.), B., 763.
- purification of, and its derivatives, (P.), B., 138.
- as reagent for hæmoglobin, A., 530.
- condensation product of, with phthalic anhydride, A., 171.
- molecular compound of, with 4:6-*dichloro*-1:3-*d*-nitrobenzene, A., 259.
- derivatives, A., 1243.
- determination of, potentiometrically, by diazotisation, A., 955.
- Benzidine, 3:3'-*di*hydroxy-, and its derivatives, A., 1243.
- Benzidine bases, losses in production of, A., 1244.
- Benzidine conversion, analogy between dissociation of oxides of nitrogen and, A., 375.
- Benzidine dyes, substantivity of, B., 253.
- Benzils, constitution of, A., 947.
- Benzilic acid, nitration of, and 2:2'-*di*-amino-, *di*hydrochloride and 2:2'-*di*-nitro-, and its aniline salt, A., 1129.
- p*-phenylphenacyl ester, A., 745.
- Benzinazole-5-arsinic acid, sulphate of, A., 69.
- N*-Benzimino-3:5-*dichloro*phenyl ether, 3:5-*dichloro*-, A., 846.
- Benziminoether hydrochloride, *o*-hydroxy-, A., 55.
- Benzine, synthesis of, from carbon monoxide and hydrogen, B., 666.
- cobalt catalysts for, B., 376.
- production of, by cracking of German raw oil, B., 584.
- by destructive hydrogenation of carbonaceous materials, (P.), B., 1066.
- from tars rich in creosote, (P.), B., 829.
- thermal decomposition of, A., 1099.
- content of, in blood, after administration, A., 87.
- cracked, hydrogenation of, B., 826.
- Leuna, catalytic hydrogenation of, B., 327.
- light, Swedish, B., 968.
- petroleum and synthetic, comparative engine tests on, B., 584.
- solvent, clarification of, (P.), B., 10.
- detection of, in bone-extraction apparatus, B., 354.
- determination of classes of hydrocarbons in, B., 8.
- Benzobisoxazine dyes, manufacture of, (P.), B., 541.
- Benzotribromide, A., 717.
- Benzocaine, determination of, B., 1104.
- 1:2-Benzocamphanquinoxalines, A., 276.
- Benzotrichloride, condensation of, with phenols, A., 946.
- Benzodifuran, derivatives of, A., 860.
- vic*-Benzodifurans, A., 53.
- $\beta\beta$ -Benzo- $\alpha\alpha'$ -*di*hydrofurans,  $\alpha\alpha'$ -substituted, A., 1258.
- Benzofurazan, and its oxide, constitution of, and *di*bromo-, A., 175.
- Benzofurazan, *di*amino- and 4:6-*d*-nitro-7-hydroxy-, and their derivatives, A., 53.
- Benzofurazan-4:7-quinone, oximes of, A., 52.
- Benzofuroxan, 4:7-*d*-nitro- and 4:6-*d*-nitro-7-hydroxy-, and its salts, A., 53.
- Benzoic acid, ionisation constant of, A., 809.
- activity coefficient of, A., 809.
- determination of coefficient of cubical expansion of, A., 116.
- chemistry of conjugation of, A., 538, 645.
- hydrogenation of, catalytically, A., 268.
- sulphonation of, A., 738.
- preservation of foods with, B., 47.
- Benzoic acid, detection of, in wines, B., 281.
- in foods and wines, in presence of salicylic acid, B., 700.
- determination of, by Mohler's method, A., 632.
- Benzoic acid, silver salt, ion activity coefficients of, A., 809.
- Benzoic acid, esters, and electronic affinities of radicals, A., 612.
- acetamidophenyl esters, A., 51.
- tert*-butyl ester, A., 719.
- and amino- and nitro-, dialkylamino-methyl esters, A., 845.
- ethyl ester, carbonyl group in, A., 612.
- reaction of, with sodium alkoxide, A., 831.
- phenyl ester, hydrolysis of, in aqueous ethyl alcohol, A., 1246.
- o*- $\beta$ -phenylpropionamidophenyl ester, A., 1026.
- resorciny ester, preparation of, A., 1126.
- and nitro-, spinasteryl esters, A., 381.
- Benzoic acid, *m*-amino-, methyl ester hydrochloride, A., 58.
- p*-amino- and *p*-nitro-,  $\gamma$ -piperidylpropyl esters, hydrochlorides of, A., 846.
- o*-bromo-, *p*-hydroxy-, and *mono*- and *di*-nitro-, *p*-phenylphenacyl esters, A., 745.
- 5-bromo- $\beta$ -nitro-4-hydroxy-, and its derivatives, A., 734.
- o*-chloro-, formation of, by action of chlorine on saccharin, A., 1029.
- p*-chlorodithio-, A., 743.
- m*-fluoro-, amide of, A., 1247.
- p*-hydroxy-, esters, detection of, in wines, B., 281.
- 2-iodo-3:5-*d*-nitro- and 2-iodoxy-5-nitro-, A., 1128.
- 3:5-*d*-nitro-, esters, optical properties of, A., 1109.
- 3-nitro-4-hydroxy-, salts of, A., 160.
- dithio-, dimethylenecammonium salt, A., 48.
- Benzoic acids, amino-, *p*-toluenesulphonyl derivatives, A., 375.
- chloro-, hydroxy- and nitro-, *p*-bromophenacyl esters, A., 1249.
- hydroxy-, and their esters and derivatives, constitution of, in relation to action on micro-organisms, A., 95.
- action of moulds on, A., 882.
- conjugation of, in the body, A., 1060.
- nitro-, reduction of, A., 513.
- Benzoic anhydride, *p*-bromo-, *p*-chloro-, 2-iodo-, 2-iodoxy-5-nitro-, and *o*-nitro-, A., 1128, 1129.
- Benzoic 3:5-*d*-nitrobenzoic anhydride, A., 1129.
- Benzoil, reduction of, A., 516, 1251.
- and chloro-, reactions of, with primary aromatic amines, A., 396.
- Benzoins, mixed, A., 1034, 1251.
- formation of amino-alcohols from, A., 746.
- 4:5-Benzointhane, and 6-hydroxy-, and their derivatives, A., 1121.
- 4:5-Benzointhanesulphonic acid, derivatives of, A., 1121.
- Benzol, purification of, by electrolytic oxidation, B., 408.
- with concentrated and 80% sulphuric acid, B., 216.
- refining of, (P.), B., 1018.
- reactions occurring in, B., 666.
- washing of, from coal gas, B., 215.
- apparatus for washing and rectifying of, B., 759.
- recovery of, (P.), B., 92.
- in coal distillation, B., 632.



Benzol, recovery of, with gas oil, B., 759.  
vertical heat exchanger for distillation of, B., 327.  
sulphur in, B., 1016.  
crude, treatment of, (P.), B., 1018.  
washing of, and treatment of waste acid, B., 759.  
motor, gum formation in, B., 169.  
determination in, of total sulphur, B., 790.  
of traces of water, B., 872.  
See also Benzene.

Benzonitrile, compounds of, with polyiodides, A., 1205.

Benzonitrile, *p*-chloro- and *p*-iodo-, dipole moments of, A., 677.  
2:4-dichloro-, A., 266.  
2:6-dichloro-3-amino- and -3-nitro-, and 6-chloronitro-2-hydroxy-, A., 743.  
2:3-dihydroxy-, and its derivatives, A., 1245.

Benzo-2:4:6-trinitroanilide, A., 1124.

Benzopentindole, 11-bromo-, and its acetyl derivative, A., 169.

Benzopentindole-7-carboxylic acid, and bromo-, ethyl esters, A., 169.

1:12-Benzophenylene-Bz1:Bz2-dicarboxylic anhydride, and its potassium salt, A., 731.

Benzophenone, preparation of, from acid halides and Grignard reagent, A., 272.  
heat of combustion of, A., 229.  
crystallisation of, A., 1078.  
reaction of, with magnesium cyclohexyl halides, A., 1250.  
diazide, thermal decomposition of, A., 476.

Benzophenone, *o*-cyano-, A., 1258.  
4-hydroxy-, benzoyl derivative, A., 946.

Benzophenones, manufacture of, (P.), B., 1114.

Benzophenone-*p*-chloroanil, A., 506.

Benzophenonechloroimine, *mono*- and *di*-chloro-, A., 853.

Benzophenone-3:2'-dicarboxylic acid, 4-hydroxy-, and its derivatives, A., 1031.

Benzophenone-*pp*-distibinic acid, A., 867.

Benzopolymethylene rings, 16-membered, A., 1134.

Benzopurpurin-4 B, moisture in, B., 637.

Benzoquinone, formation of, in oxidation of phenol with peracetic acid, A., 610.  
influence of water on oxidising action of, A., 164.  
condensation of, with *p*-tolyl methyl ether, A., 396.  
oxime, tautomerism of, A., 1026.

Benzoquinone, 2-chloro-, 4-oxime, derivatives of, A., 509.

tetrachloro-, preparation of, A., 947, 1252.

Benzoquinones, equilibrium constants and conversion values of, A., 947.

Benzoquinoneacetic acid, oxidation-reduction of homogentisic acid to, A., 1000.

*p*-Benzoquinone-*d*-camphorsulphone, A., 947.

Benzoyl bromide, *m*-bromo-, A., 1261.  
chloride, action of, with hydrogen selenide, A., 382.  
with lithium hydride, A., 846.  
with potassium pyrosulphite, A., 268.  
hydrochloride, *o*-amino-, A., 376.  
peroxide, action of, on  $\gamma$ -ethylpentane, A., 250.  
with triphenylmethyl, A., 379.

Benzoylactic acid, and its homologues, preparation of ethyl esters of, A., 945.

Benzoylacetie acid, *mono*- and *di*bromo-, ethyl esters, A., 280.

Benzoylacetone, additive compound of, with ethyl acetoacetate, A., 366.

Benzoyl-*p*'-acetylaminonilide, *p*-nitro-, A., 867.

3-Benzoyl-9-acetylcarbazole, A., 1041.

$\alpha$ -Benzoyl- $\alpha$ -acetylglutaric acid, ethyl ester, A., 1112.

$\alpha$ -Benzoyl- $\alpha$ -acetylsuccinic acid, ethyl ester, A., 1112.

Benzoyl-3-amino-4-methylbenzoyl- $\beta$ -naphthylamine-4:6:8-trisulphonic acid, 3'-nitro-, trisodium salt, A., 840.

Benzoylsulphonic acid, manufacture of derivatives of, (P.), B., 496.  
preparation of anthraquinone-2-sulphonic acid from, A., 947.

Benzoylbenzoic acid, 4'-amino-2-*p*-amino-, halogen derivatives of, (P.), B., 974.  
4:5:4'-trichloro-, A., 273.

Benzoylbenzoic acids, and their transformation into anthraquinones, A., 617.

Benzoylbenzophenone, 2-hydroxy-5-*o*-hydroxy-, A., 613.  
4'-hydroxy-2-*p*-hydroxy-, and its derivatives, A., 617.

3-Benzoylbenzophenone, 4-hydroxy-, A., 946.

1-Benzoyl-3:2-*o*-benzylene-3-ethylindoline, 2-hydroxy-*p*-nitro-, A., 1261.

1-Benzoyl-3:2-*o*-benzylene-3-methylindoline, 2-chloro-, 2-chloro-*p*-nitro- and 2-hydroxy-, A., 1261.

1-Benzoyl-3:2-*o*-benzylene-3-phenylindoline, 2-chloro- and -*p*-nitro-, and 2-hydroxy- and -*p*-nitro-, A., 1261.

6-Benzoyl-2-benzylindole, A., 839.

Benzoylbromocarbonyl acetate, and its derivatives, A., 851.

2-Benzoylcyclobutane-1-carboxylanilide, A., 746.

$\alpha$ -Benzoylbutyric acid, preparation of amide and nitrile from, A., 945.

3-Benzoylcarbazole, and its oxime, A., 65.

Benzoylcarbazoles, and their derivatives, A., 1041.

*N*-Benzoylcarbonato- $\gamma$ -glutamyl- $\delta$ -glutamic acid, and its diethyl ester, A., 936.

Benzoyl-2:2'-dichlorodiphenylamine, A., 846.

Benzoylcupein B, and its chloro-derivative, A., 529.

5-Benzoylcoumaric acid, 2-hydroxy-, and its derivatives, A., 947.

Benzoylcreatinine, potassium salt, A., 951.

Benzoyldehydrothio-*p*-toluidinesulphonic acid, 3-amino-, and 3-nitro-, sodium salt, A., 176.

6-Benzoyl-3:4-diacetylglucal, A., 723.

1-Benzoyl-3:3-dimethylindolines, 2-bromo-1-*m*-bromo-, and 2-chloro-1-*p*-nitro-, A., 1260.

1-Benzoyldimethylnaphthalenes, A., 374, 1136.

3-Benzoyl-2:2-dimethyl-2:3:4:5-tetrahydrocarbolone, A., 289.

6-Benzoyldiphenylamine, 2-amino-, A., 1041.

Benzoyl-*s*-diphenyl-*o*-phenylenediamine, A., 846.

$\alpha$ -Benzoyl- $\beta$ -diphenylpropionic acid, ethyl ester, A., 616.

$\alpha$ -Benzoyl- $\alpha$ - $\delta$ -piperidinopropionic acid, ethyl ester, A., 280.

*N*-Benzoyl-*NN'*-diisopropyl-*o*-phenylenediamine, A., 154.

12-Benzoylfluoranthrene, and its oxime, A., 847.

2-Benzoylfluorenone, 7-amino- and 7-nitro-, and their derivatives, A., 733.

1-2'-Benzoylfluorenone-7'-azo-2-hydroxy-naphthalene-3-carboxylanilide, A., 733.

2-Benzoylfluorenone-7-sulphonic acid, and its sodium salt, A., 733.

*N*-Benzoylformamidoxime, cyano-, and its acetyl derivative, A., 1267.

*N*-Benzoylfurylalanine, A., 949.

6-Benzoylglucose diethylmercaptal, A., 723.

Benzoylglycine, *p*-amino-, A., 957.

Benzoylglycollic acid, and its anhydride, A., 598.

Benzoyl-*dl*-leucine, *p*-amino-, A., 957.

Benzoyl-*N*-methylhomogranatoline, pharmacology of, A., 965.

2-Benzoyl-5-methylisooxazol-3-one, A., 1145.

Benzoyl-6-naphthoic acid, A., 839.

2-Benzoyl- $\alpha$ -naphthol, acetyl derivative, A., 520.

Benzoyl- $\beta$ -naphthylamine-4:6:8-trisulphonic acid, 3-nitro-, trisodium salt, A., 840.

Benzoylnitrophenylthiocarbamide, A., 376.

*o*-Benzoyloxybenzoic anhydride, A., 1129.

Benzoyloxymethoxybenzaldehydes, *mono*- and *di*-hydroxy-, A., 859.

3-Benzoyloxy-4-methoxyphenylacet- $\beta$ -*m*-benzyloxyphenylethylamide, A., 1040.

3-Benzoyloxy-4-methoxyphenylacetic acid, A., 1040.

$\alpha$ -Benzoyloxy- $\alpha$ -phenylpropane,  $\beta$ -amino-, hydrochloride, A., 611.

Benzoyloxystyrenes, A., 943.

5-Benzoyloxy-7-tetra-acetyl- $\beta$ -glucosidyl-flavylum chloride, 3:4'-dihydroxy-, A., 859.

$\alpha$ -Benzoylphenylacetic acid,  $\alpha$ -bromo-, ethyl ester, A., 280.

5-Benzoyl-1-phenylbenzotriazole, and its oximes, A., 66.

7-Benzoyl-1-phenylbenzotriazole, A., 1041.

*p*-Benzoylphenyldibromarsine, A., 953.

*p*-Benzoylphenyldichloroarsine, A., 953.

Benzoyl-*N*-phenyl-*N'*-*o*-chlorophenyl-*o*-phenylenediamine, A., 846.

6-Benzoyl-2-phenyl-5:6-dihydro-1:4-pyran, 3-cyano-, and its oximes, A., 63, 279.

Benzoylphenyldiodoarsines, A., 953.

$\gamma$ -Benzoyl- $\beta$ -phenyl- $\alpha$ -*p*-nitrophenylbutyric acids, and their derivatives, A., 269.

$\gamma$ -Benzoyl- $\alpha$ -phenyl- $\beta$ -*p*-tolylbutyric acid, and its derivatives, A., 158.

*N*-Benzoylphenylurethane, A., 1025.

2-*O*-Benzoylphloroglucinaldehyde, salts of, A., 859.

*N*-Benzoylpiperonylalanine, A., 1144.

$\alpha$ -Benzoylpropionamide, A., 945.

$\alpha$ -Benzoylpropionic acid,  $\alpha$ -bromo-, ethyl ester, A., 280.

*N*-Benzoyl-*N'*-isopropyl-*o*-phenylenediamine, A., 154.

Benzoylisoserines, derivatives of, A., 1118.

2-Benzoylsulphobenzoic acids, salts of, A., 396.

6-Benzoyl-1:2:3:4-tetra-acetylglucose, A., 723.

5-*o*-Benzoyl-4'-tetra-acetyl- $\beta$ -glucosidylpelargonidin chloride, A., 859.

6-Benzoyltetrahydrocarbazole, A., 1041.

Benzoyltetrahydronaphthacarbazoles, 5-bromo-, A., 1039.

*S*-Benzoylthiolindoles, and their derivatives, A., 753.

Benzoylthioncarbamie acid,  $\beta$ -chloroethyl ester, A., 758.

6-Benzoyl-2:3:4-triacetylglucose, 1-bromo-, A., 723.

1-Benzoyl-2:2:4-trimethyldihydroquinoline, A., 1142.

*p*-Benzoyltriphenylacetoneitrile, A., 740.

$\alpha$ -Benzoyltriphenylcarbinol, derivatives of, A., 1258.

*p*-Benzoyltriphenylcarbinol, A., 740.

*o*-Benzoyltriphenylmethane, and its 2:4-dinitrophenylhydrazones, A., 1258.  
*p*-Benzoyltriphenylmethyl, and its peroxide, A., 746.  
*p*-Benzoyltriphenylmethyl chloride, A., 740.  
 $\alpha$ -Benzylvaleric acid, amide and nitrile from, A., 945.  
 $\delta$ -Benzylvaleric acid,  $\alpha$ -hydroxy-, and its oxime, A., 279.  
*N*-Benzylvalines, *p*-nitro-, ethyl esters, A., 837.  
Benzzpinacols, *o*-substituted, rearrangement of, A., 854.  
*S*-Benzzpinacols, relative migration of aryl groups in, A., 515.  
Benzzpiperoic, oxime, A., 271.  
Benzquinazocolines, A., 66.  
Benzthiazole, thiol-, dimethylenecammonium salt, A., 48.  
2-thiol-, additive compound of, with formaldehyde, A., 1114.  
Benzthiazoles, condensation of, with aldehydes and ketones, A., 286.  
Benzthiazoles, amino-, A., 1046.  
thiol-, manufacture of, (P.), B., 494.  
Benzthiazolines, condensation of, with aldehydes and ketones, A., 286.  
Benzthiazolyguanidine, and its salts and derivatives, A., 176.  
Benzthioamide, *p*-amino-, acetyl derivatives, A., 758.  
Benz-*p*-thioarsinic acid, di- $\beta$ -amino- $\beta$ -carboxyethyl ester, A., 70.  
Benzveratrylamidine, and its salts, A., 55.  
Benzyl alcohol, dipole moment of, A., 677.  
action of radium rays on, A., 1007.  
reactions of, with azo- and azoxy-compounds, A., 155.  
detection of, in essential oils in presence of ethyl and methyl alcohols, B., 703.  
Benzyl alcohol, 2:4-dichloro-, A., 266.  
Benzyl alcohols, nitro-, reduction of, A., 513.  
Benzyl alkyl ethers, A., 1245.  
bromide, *m*-iodo-, A., 384.  
chloride, and related compounds, polymers of, A., 607.  
nitration of, A., 50.  
2:6-dichloro-, A., 385.  
chlorides, action of aluminium chloride on, A., 50.  
halides, interaction of, with bases, A., 1241.  
methyl ether,  $\alpha$ -chloro-. See  $\alpha$ -Methoxybenzyl chloride.  
radicals, affinity capacity of, A., 395.  
substituted, relative migratory velocities of, A., 262.  
 $\beta$ -Benzylallyl bromide, A., 616.  
Benzylamine, isomerism of condensation products of, with ethyl acetoacetate, A., 257.  
Benzylamines, *m*-halogeno-, and their derivatives, A., 384.  
5-Benzylaminobarbituric acid, 5-bromo-, A., 283.  
Benzylaminomethylenecamphors, A., 857.  
Benzylammonium trithiocarbonate, A., 150.  
*N*-Benzylanabasine, and its picrate, A., 758.  
Benzylaniline, *p*-toluenesulphonyl derivative, A., 375.  
10-Benzylanthrones, chloro-1-eyano-, A., 395.  
Benzylbenzanthrone, A., 731.  
 $\alpha$ -Benzyl- $\beta$ -benzylidenepropionic acid. See  $\alpha\delta$ -Diphenyl- $\Delta^2$ -butene- $\beta$ -carboxylic acid.  
 $\Delta$ -Benzyl- $\alpha$ -benzyl- $\alpha$ -methyl-*n*-propylketone, A., 1126.  
Benzylbrucidininium chloride, A., 528.

Benzylneobrucidinium iodide, A., 528.  
Benzylbrucine, A., 528.  
Benzylbrucininium chloride, A., 528.  
 $\alpha$ -Benzyl-*n*-butyric acid, amyl ester, A., 842.  
 $\alpha$ -Benzylbutyronitrile,  $\alpha$ -amino-, derivatives of, A., 862.  
Benzylcarbinol, dipole moment of, A., 984.  
*N*-Benzylcarbonatoalanines, A., 935.  
*N*-Benzylcarbonato-*d*-alanyl-*d*-glucosamine, and its tetra-acetate, A., 935.  
*N*-Benzylcarbonato-*d*-arginine, A., 936.  
*N*-Benzylcarbonato-*L*-asparagines, A., 936.  
Benzylcarbonato-*L*-asparagyl-*L*-tyrosine, ethyl ester, A., 936.  
*N*-Benzylcarbonato-*L*-aspartic acid, and its anhydride, A., 936.  
*N*-Benzylcarbonato-*d*-glutamic acid, and its anhydride, A., 936.  
*N*-Benzylcarbonato-*d*-glutamines, A., 936.  
*N*-Benzylcarbonatoglycine, and its chloride, A., 935.  
*N*-Benzylcarbonatoglycyl-*d*-glucosamine, and its tetra-acetate, A., 935.  
Benzylcarbonatoglycylglycine, A., 936.  
*N*-Benzylcarbonato-*L*-histidine, A., 936.  
*N*-Benzylcarbonato-*DL*-phenylalanine, A., 936.  
*N*-Benzylcarbonato-*DL*-serine, A., 935.  
*N*-Benzylcarbonato-*L*-tyrosine, A., 936.  
Benzylcellulose, A., 725.  
manufacture of, B., 976; (P.), B., 256.  
purification of, (P.), B., 881.  
Benzylchlorobenzylmalonic acids, ethyl esters, A., 1243.  
Benzyl-*m*-cresols, and their derivatives, A., 611.  
 $\alpha$ -Benzylcrotonic acid, formation of, from  $\alpha$ -vinylcinnamic acid, A., 739.  
*O*-Benzylidihydroesperetic acid, and its derivatives, A., 175.  
3-Benzyl-2:3-dihydro-1:4- $\alpha$ -naphthapyrone, and 2-hydroxy-, A., 520.  
4-Benzylidihydrothebaine, 7-amino-, A., 953.  
3-Benzyl-2-(3:4'-dimethoxystyryl)-1:4- $\alpha$ -naphthapyrone, A., 520.  
Benzylidimethylallylammonium salts, A., 854.  
Benzylidimethylamines, halogeno- and nitro-, and their picrates, A., 262.  
Benzylidimethylcarbomethoxymethylammonium bromide, A., 605.  
Benzylidimethylcarbomethoxymethylammonium bromide, A., 605.  
5-Benzyl-1:2-dimethylpyrrole, A., 622.  
3:2-*o*-Benzylene-3-methylindolenine, and its salts, A., 1261.  
(+)- $\alpha$ -Benzylethylamine, and its derivatives, A., 628.  
 $\alpha$ -cycloBenzylethylamine, and its salts and benzoyl derivative, A., 628.  
*L*-Benzylethylcarbinol, and its  $\alpha$ -naphthylurethane, A., 143.  
5-Benzyl-5-ethylhydantoin, A., 862.  
Benzyl ethyl ketone 2:4-dinitrophenylhydrazones, A., 1239.  
2-Benzylfluorene, and 7-amino-, and 7-nitro-, A., 733.  
2-Benzylfluorene-7-sulphonic acid, and its salts and derivatives, A., 733.  
 $\alpha$ -Benzylglutaconic acids, A., 1127.  
Benzylguanidine salts, A., 605.  
*O*-Benzylhesperetic acid, A., 175.  
2-Benzylcyclohexanone, formation of, and its derivatives, A., 162.  
Benzylcyclohexylidenecyclohexanone, formation of, and its oxime, A., 162.  
*S*-Benzyl-*n*-hippuryleysteine, methyl ester, A., 184.

*O*-Benzylhomoisovanillo- $\beta$ -3-benzoyloxy-4-methoxyphenylethylamide, A., 175.  
*O*-Benzylhomoisovanillo- $\beta$ -methoxy- $\beta$ -veratrylethylamide, A., 175.  
Benzylidene chloride, hydrolysis of, A., 345.  
Benzylideneacenaphthenone, *o*-nitro-, A., 1041.  
Benzylideneacetone, preparation of, B., 12.  
preparation and determination of, A., 853.  
derivatives of, A., 618.  
determination of, iodometrically, A., 868.  
Benzylideneacetylcreatinine, potassium salt, A., 951.  
Benzylideneacetylmethylcreatinine, A., 951.  
1-Benzylideneamino-5-allylaminotetrazole, A., 172.  
1-Benzylideneamino-5-aminotetrazole, A., 172.  
6-(*p*-Benzylideneamino)-2-(*p*-nitrophenyl)-benzthiazole, 6-*p*-nitro-, A., 68.  
 $\omega$ -Benzylideneamino-*m*-tolyltrimethyl ammonium iodide, A., 384.  
Benzylideneaniline, 2:4-dinitro-, A., 851.  
Benzylideneanilines, action of acetic anhydride on, A., 384.  
Benzylidenebenzylamines, *m*-halogeno-, A., 384.  
6-Benzylidene-2-benzylcyclohexanone, A., 1032.  
Benzylidenenebilirubin acid, *p*-nitro-, A., 627.  
Benzylidenenebisacetoacetic acid, *p*-hydroxy-, ethyl ester, A., 512.  
Benzylidenenebisdi-indones, chloro-, hydroxy-, and nitro-, A., 1252.  
Benzylidenenebisthiolacetic acid, 2:4-dihydroxy-, A., 1235.  
Benzylidenenebistriacetic acid, A., 748.  
Benzylidene-*p*-bromoaniline dibromide, A., 742.  
Benzylidene-*p*-bromoaniline, 2:4:6-trinitro-, A., 851.  
Benzylidene-2-bromo-*p*-toluidine, 2:4:6-trinitro-, A., 851.  
 $\alpha$ -Benzylidene-10-carboxy-2-phenanthrylacetic acid, *o*-hydroxy-, A., 747.  
Benzylidenecyanoacetic acid, *o*-chloro-, A., 1247.  
Benzylidenecyanoacetic acids, nitro-, A., 1247.  
Benzylidenedeoxybenzoin oxime, A., 163.  
Benzylidenedihydrazinotriphenylmethanes, chloro-*pp''*-dichloro- and nitro-*pp''*-dinitro-, A., 1026.  
Benzylidenediketohydrindenedi-indones, nitro-, A., 1252.  
Benzylidene-*m*-dimethylaminobenzylamine, A., 384.  
10-Benzylidenedimethylanthrones, A., 746.  
Benzylidenedimethylidihydroresorcinol, *o*-amino-, acetyl derivative, and *o*-nitro-, A., 403.  
Benzylidenedipiperidyl, *p*-hydroxy-, A., 512.  
Benzylidene-ephedrine, A., 757.  
Benzylideneflavone, *o*-nitro-, A., 175.  
4:6-Benzylidene- $\alpha$ -*d*-glucose 1:2:3-tribenzoate, A., 1115.  
Benzylidene-*m*-halogenobenzylamines, A., 384.  
Benzylidenecyclohexane, A., 373.  
Benzylidenecindolines, thio-*p*-nitro-, A., 753.  
2-Benzylidene-1-ketodihydrothionaphthen, A., 861.  
Benzylidene-*m*-methoxybenzylamine, A., 384.  
Benzylidene-4'-methoxyflavanone, *o*-nitro-, A., 175.  
Benzylidene-*m*-methylbenzylamine, A., 384.  
Benzylidene-3':4'-methylenedioxyflavanone, *o*-nitro-, A., 175.

- $\alpha$ -Benzylidene- $\beta$ -methylglutaric acid. See  $\alpha$ -Phenyl- $\gamma$ -methyl- $\Delta^a$ -butene- $\beta\beta$ -dicarboxylic acid.
- 6-Benzylidenemethylcyclohexanones, and their derivatives, A., 1032.
- Benzylidene- $\alpha$ -naphthylamine, A., 742.
- Benzylidene- $\beta$ -naphthylamine, 2:4:6-trinitro-, A., 851.
- Benzylidene-*m*-nitroaniline, 2:4:6-trinitro-, A., 851.
- Benzylidene-*m*-nitrobenzylamine, A., 384.
- Benzylidene-2-phenyloxazol-5-ones, 4-fluoro-, A., 1129.
- Benzylidenephthalide, action of magnesium benzyl chloride on, A., 396.
- Benzylidenepinacolone, reduction product of, A., 163.
- Benzylidenepulenone, and its derivatives, A., 161.
- Benzylidenequinaldine hydrochloride, A., 1261.
- Benzylideneneostrychnine, A., 527.
- Benzylidenetetrahydrophthalide, A., 269.
- Benzylidene-*p*-toluidine, 2:4:6-trinitro-, A., 851.
- Benzylidenevomicine, A., 408.
- $\omega$ -Benzylimino-*m*-tolyltrimethylammonium iodide, A., 384.
- 3-Benzyl-2-methoxystyryl-1:4- $\alpha$ -naphthapyrones, A., 520.
- Benzylmethylamine picrate, A., 854.
- 5-Benzyl-1-methyl-2-ethylpyrrole, A., 622.
- $\alpha$ -Benzyl- $\beta$ -methylglutaconic acids, A., 1127.
- $\alpha$ -Benzyl- $\gamma$ -methylglutaconic acid, and its ethyl ester, A., 1128.
- Benzylmethylglyoxime, isomeric nickel derivatives of, A., 272.
- 2-Benzyl-4-methylcyclohexanone, and its derivatives, A., 1032.
- 6-Benzyl-2-methylcyclohexanone, 6-cyano-, A., 744.
- 5-Benzyl-5-methylhydantoin, A., 862.
- Benzyl methyl ketone, 2:4-dinitro-, bromoderivatives, A., 405.
- Benzyl methyl ketoxime, 2:4-dinitro-, rearrangement of, and its derivatives, A., 404.
- 3-Benzyl-2-methyl-1:4- $\alpha$ -naphthapyrone, A., 520.
- trans*- $\alpha$ -Benzyl- $\beta$ -methyl- $\Delta^a$ -propene- $\alpha\gamma$ -dicarboxylic acid, and its ethyl ester, A., 1128.
- 2-Benzyl-1-methylpyrrolidine, and its salts, A., 1141.
- 5-Benzyl-1-methyl-2-pyrrolidone, A., 1141.
- 2-Benzyl-1-methyl- $\Delta^2$ -pyrroline, and its perchlorate, A., 1141.
- 5-Benzyl-1-methylpyrrolone, A., 521.
- $\omega$ -Benzyl- $\omega$ -methylthiolacetophenone, A., 262.
- 3-Benzyl- $\alpha$ -naphthylavone, A., 520.
- 2-Benzyl-naphthalene, 6-amino-, and its acetyl derivative, A., 839.
- Benzyl-3-nitrophthalimide, and *p*-nitro-, A., 1231.
- O*-Benzyl-6-nitrovanillic acids, nitro-, A., 615.
- Benzyl-6-nitrovanillins, nitro-, and their derivatives, A., 615.
- Benzylacetaldehyde, and its derivatives, A., 384.
- $\alpha$ -Benzylbenzylhydramine, and its hydrochloride, A., 52.
- $\alpha$ -Benzylbenzophenone, and its derivatives, A., 52.
- 6-Benzyl-1:3'-benzyl-4'-methoxybenzyl-3:4-dihydroisoquinoline, derivatives of, A., 1040.
- Benzylxycarbonyl chloride, A., 935.
- Benzylxyergostatriene, A., 267.
- 4-Benzyl-3-methoxybenzylidenehippuric acid, A., 69.
- 3-Benzyl-4-methoxycinnamic acid. See *O*-Benzylhesperetic acid.
- 3-Benzyl-4-methoxyphenylacet- $\beta$ -3:4-dibenzylxyphenylethylamide, A., 1041.
- 4'-Benzyl-3'-methoxyphenylacet- $\beta$ -3:4-dimethoxyphenylethylamide, 2'- and 6'-nitro-, A., 69.
- 3-Benzyl-4-methoxyphenylacetic acid, A., 175.
- 4-Benzyl-3-methoxyphenylacetic acid, and 6-nitro-, A., 69.
- 4-Benzyl-3-methoxyphenylacetic acid, 2-nitro-, A., 56.
- $\beta$ -3-Benzyl-4-methoxyphenylethylamine, and its salts, A., 175.
- $\beta$ -3-Benzyl-4-methoxyphenylpropionhydrazide, A., 1040.
- 3-Benzyl-4-methoxyphenylpyruvic acid, A., 175.
- 4-Benzyl-3-methoxyphenylpyruvic acid, A., 69.
- 3-Benzyl-4-methoxystyrene,  $\omega$ -nitro-, A., 175.
- $\beta$ -*m*-Benzylphenylpropionhydrazides, A., 1040.
- 4-Benzylpyridine-2:6-dicarboxylic acid, 3:5-diiodo-, and its methyl ester, A., 622.
- 4'-Benzyl-6:7:3'-trimethoxy-1-benzyl-3:4-dihydroisoquinolines, nitro-, and their salts, A., 69.
- 4'-Benzyl-6:7:3'-trimethoxy-1-benzyl-2-methyltetrahydroisoquinoline, 2'-amino-, dipicronate, A., 69.
- 4'-Benzyl-6:7:3'-trimethoxy-2-methyltetrahydroisoquinoline, 6'-amino-, dipicronate, A., 69.
- Benzyl  $\beta$ -phenyl- $\alpha$ -anisylethyl ketone, and its derivatives, A., 389.
- Benzyl  $\alpha$ -phenylethyl ketone, and its semicarbazone, A., 393.
- Benzyl  $\beta$ -phenylethyl ketone, and its derivatives, A., 395.
- Benzyl  $\alpha$ -phenyl-*n*-propyl ketone, and its semicarbazone, A., 393.
- cis*- $\alpha$ -Benzyl- $\Delta^a$ -propene- $\alpha\gamma$ -dicarboxylic acid, A., 1128.
- $\alpha$ -Benzylpropionitrile,  $\alpha$ -amino-, derivatives of, A., 862.
- 2-Benzyl-2-propylcyclohexanone, formation of, and its derivatives, A., 162.
- 2-Benzylpyrrolidine, and its picrate, A., 1260.
- Benzylisoquinoline series, syntheses in, A., 1040.
- Benzylstrychnidinium hydroxide, A., 406.
- Benzylneostrychnidinium salts, A., 406.
- 3-Benzyl-2-styryl-1:4- $\alpha$ -naphthapyrone, and its dibromide, A., 520.
- Benzylsuccinic acid, derivatives of, A., 1131.
- Benzylthioarabinside, and its diacetate, A., 45.
- Benzylthiocarbamic acid, and nitroso-, iron salts, A., 32.
- N*-Benzylthiodiphenylamine, and its sulphone, A., 630.
- 2-Benzylthiol-4-hydroxymethyluracil, A., 952.
- p*-Benzyltriphenylacetone,  $\alpha$ -cyano-, A., 740.
- Benzyluracil-4(6)-carboxylic acids, and their ethyl esters, A., 66.
- O*-Benzylvanillin, nitration of, and nitro-, A., 615.
- Benzylvanillylethylamine, pharmacology of, A., 877.
- Benzylvinylcarbinol, A., 616.
- Benzylxanthic acid, copper salt, A., 718.
- Berberine alkaloids, nomenclature of alkaloids related to, A., 408.
- Berberrubine, A., 177.
- Berbine, A., 408.
- isoBergapten, A., 860.
- Bergenia cordifolia*, glucoside hydrolysable by emulsin in, A., 313.
- Bergenia crassifolia*. See Badan.
- Berberi, A., 80.
- tissue respiration in, A., 1056.
- quotient for, in nutrition with polished rice and autoclaved grain, A., 200.
- lecithins of rice in connexion with, A., 417.
- from deprivation of vitamin-B, A., 200.
- and neuritis, A., 767.
- Berries, carotenoids in, A., 785.
- Beryl from Erythraea, A., 1106.
- Beryllium, B., 844.
- pure, B., 941.
- atomic weight of isotope of, A., 790.
- molecular structure of, A., 319.
- valency forces in, A., 1.
- production of, (P.), B., 189.
- from beryl, (P.), B., 547.
- electrolytically, (P.), B., 991.
- from its oxide, B., 553.
- recovery of, from minerals, (P.), B., 465.
- from silicate ores, (P.), B., 775.
- properties of, A., 582.
- arc spectrum of, A., 552.
- broadening of spectrum of, A., 207.
- lattice constants of, A., 797.
- rays from, due to  $\alpha$ -rays from radon, A., 442.
- penetrating rays from, A., 556, 672.
- $\gamma$ -rays from, A., 210, 671, 895, 1186.
- excitation of neutrons from, A., 894, 1073.
- dispersion of neutrons from, A., 672.
- penetrating power of neutrons from, A., 672.
- cathodic sputtering of, in helium, A., 981.
- Hall effect in, A., 1080.
- evaporation of, A., 828.
- crystal structure of, A., 1192.
- production of thin films of, (P.), B., 803.
- films, photo-electric properties of, A., 789.
- Beryllium alloys, production of, (P.), B., 267.
- with iron, A., 455.
- with iron and tungsten, (P.), B., 609.
- with magnesium, manufacture of, B., 941.
- Beryllium compounds, diamagnetic susceptibilities of, A., 795.
- electrolysis of solutions of, in liquid ammonia, A., 129.
- Beryllium salts, production of, (P.), B., 421.
- Beryllium ferrite, A., 29.
- halides, dipole moments of, and their molecular compounds, A., 447.
- vapour densities and pressures of, A., 1195.
- hydride, band spectrum of, A., 207.
- hydroxide, decomposition pressure of, A., 573.
- crystalline, heat of formation of, A., 575.
- nitride, heat of formation of, A., 470.
- oxide, production of, (P.), B., 146.
- band spectrum of, A., 557.
- reducibility of, B., 1121.
- sols, hydrated, A., 335, 692.
- silicate, gravimetric analysis of rocks of, A., 1011.
- sulphate tetrahydrate, crystal structure of, A., 681.
- Fluoberyllates, A., 131, 582, 706.
- Sulphatoberyllates, A., 706.
- Beryllium organic compounds:—
- Beryllium benzoylcamphor, catalysis of mutarotation of, in carbon tetrachloride, A., 578.
- velocity of mutarotation of, A., 346.

**Beryllium detection and determination** :—  
 detection of, microchemically, A., 1223.  
 in minerals, A., 588.  
**determination of**, B., 429.  
 and its separation from iron, copper,  
 etc., A., 1103.  
 gravimetrically, and its separation, A.,  
 489.  
 in steel and ferroberyllium, B., 427.  
**Beryllium ores**, analysis of, A., 243.  
**Betaines**, formation of, in plants, A., 975.  
 derivatives of, A., 605.  
**Betanin**, nature of, A., 750.  
**Betulin**, A., 1138.  
 diacetate, dehydrogenation of, A., 1245.  
*apoBetulin acetate*, A., 1138.  
**Betulins**, A., 749.  
*apocalloBetulins*, A., 749.  
 Betulyl triphenyl methyl ether, A., 255.  
**Beverages**, production of, from holly leaves,  
 etc., (P.), B., 747.  
 apparatus for aëration of, (P.), B., 816.  
 preservation of, B., 367.  
 alcoholic, manufacture of, (P.), B., 320.  
 of low alcohol content, production of,  
 (P.), B., 44.  
 cereal, caffeine in, B., 959.  
 fermented, prevention of unpleasant  
 tastes in, (P.), B., 1133.  
 effervescent, production of, from milk,  
 (P.), B., 240.  
 fermented, production of, (P.), B., 958.  
 vitamin-containing, manufacture of, (P.),  
 B., 444.  
 determination in, of saccharin, B., 445.  
**Bhilawanol**, and its derivatives, A., 102.  
**Bilberry juice**, detection of, in wines, B.,  
 525.  
**Bile**, secretion of, A., 534.  
 influence of vegetative nerve system on  
 reaction of, A., 1275.  
 from gall-bladder and liver, ions in, A.,  
 1055.  
 in affections of the liver, A., 536.  
 fatty acids and organic phosphorus in, A.,  
 85.  
 influence of lecithin on solubility of fatty  
 acids in, A., 871.  
 adenine-nucleotide in, A., 531.  
 influence of feeding on bile acids in, A.,  
 639.  
 lactic acid in, during hepatic disturbance,  
 A., 536.  
 human, uncoupled bile acids in, A., 766.  
 wild pig's, bile acid of, A., 639.  
 determination in, of bile acids, A., 78.  
 of cholesterol, A., 1055.  
 of cholic acid, A., 871.  
**Bile acids**, A., 159, 383, 742, 849, 1132.  
 constitution of, A., 614, 1131, 1248.  
 ring system of, A., 736, 1131.  
 formation of, A., 534, 639.  
 after protein administration, A., 1275.  
 extraction of, from bile, A., 78.  
 photobiological properties of, A., 615.  
 influence of bacteria and of rays on,  
 A., 429.  
 bromination of, and their derivatives,  
 A., 614.  
 hypoglycæmia from, A., 424.  
 effect of, on calcium metabolism, A., 300,  
 1283.  
 on carbohydrate metabolism, A., 188,  
 299, 639, 644, 771, 875, 1059, 1282.  
 on phosphorus metabolism, A., 293.  
 in relation to carbohydrate and fat com-  
 ponents, A., 766.  
 influence of, on digestion of nucleins, A.,  
 1287.  
 in relation to sugar assimilation, A., 875.

**Bile acids**, metabolism of. See under  
 Metabolism.  
 determination of, with the step-photo-  
 meter, A., 1055.  
 in blood, A., 1053.  
 in urine, stalagmometrically, A., 1055.  
**Bile pigments**, A., 627, 1155.  
 constitution of, A., 1045.  
 rôle of spleen in formation of, A., 766.  
 fluorescence of, A., 185.  
 effect of gall-bladder activity on, A., 1155.  
 detection of, in tissues of icterous  
 animals, A., 536.  
**Bile salts**, A., 633.  
 effect of India ink and of tolylenediamine  
 on augmenting influence of, on liver,  
 A., 647.  
**Bilipurpurin**, fluorescence spectra of, A.,  
 1046.  
**Bilirubin**, absorption spectrum of, in  
 various solvents, A., 79.  
 spectroscopic examination of derivatives  
 of, with red fluorescence, A., 6.  
 fate of, introduced into blood vessels,  
 A., 534.  
 excretion of, A., 78.  
 renal threshold of, A., 958.  
 serum, A., 868.  
 van den Bergh reaction with, A., 641.  
 van den Bergh reaction with, A., 639,  
 1158.  
 determination of, A., 1053, 1279.  
 in blood-serum, A., 1272.  
 in urine, A., 1158.  
**Binary systems**. See Systems, binary.  
**Binding agents**, hydraulic, production of,  
 (P.), B., 889.  
**Biochemistry**, chain reaction theory in, A.,  
 1159.  
**Biocolloids**, union of, A., 227, 501, 766,  
 808, 1089, 1269, 1274.  
 freezing of unbound water in, A., 123.  
**Biolase**, A., 775.  
**Biological material**, effect of radiation on,  
 A., 1227.  
 digestion of, for analysis, A., 978.  
 determination of chlorides in, B., 284.  
**Biological reduction**. See under Reduction.  
**Biological stains**. See under Stains.  
**Biological systems**, directive influences in,  
 A., 649, 1170.  
**Biology**, applications of cryoscopy to, A.,  
 1203.  
**Bioluminescence**, A., 1281.  
 "Bios," fractionation of, A., 97.  
 "Biosugar," oxidation-reduction poten-  
 tial of, A., 1062.  
**Biotite**, from N. Carolina, A., 1228.  
**Birds**, carbohydrate metabolism in, A., 644.  
 biological value of proteins for nutrition  
 of, A., 1060.  
 origin of uric acid in, A., 300.  
**Bisabolene**, A., 277.  
**Bis-*p*-aminophenylazomethine**, and its di-  
 acetyl derivative, A., 867.  
**1:1'-Bis-*o*-anisyl-5:5'-azotetrazole**, A., 1044.  
**Bisarsenoinadazoles**, A., 1268.  
***o*-Bisazo-dyes**, A., 264.  
**4:5-Bisbenzeneazofluoran**, 1:8-dihydroxy-,  
 A., 266.  
**Bisbenzeneazofluorescein**, and its diacetyl  
 derivative, A., 1141.  
***o*-3:5-Bisbenzeneazo-2:4-dihydroxybenzoyl-**  
**benzoic acid**, A., 266.  
**2:4-Bisbenzeneazo-3:6-dihydroxyfluoran**, A.,  
 266.  
**Bis-4-benzylethylaminophenyl-4'-diphenyl-**  
**methane**, A., 1028.  
**Bis-4-benzylmethylaminophenyl-4'-di-**  
**phenylmethane**, A., 1028.

**Bis-*p*-bromophenyltriazenoacetylene**, A.,  
 172.  
**Bis-[ $\alpha$ -(*N'*- $\beta\beta\beta$ -trichloro- $\alpha$ -ethoxyethylcarb-  
 amido)- $\beta\beta\beta$ -trichloroethyl] ether**, A., 151  
**1:1'-Bis-*p*-chlorophenyl-5:5'-azotetrazole**,  
 A., 1044.  
***pp*-Bischlorosulphonylbenzoic anhydride**,  
 A., 939.  
**Bisdiethylamide**, and its tetrabromide, A.,  
 727.  
**Bis-4-diethylaminophenyl-4'-diphenyl-**  
**methane**, A., 1028.  
**Bisdihydrodeoxycodeine**, and its meth-  
 iodides, A., 408.  
***NN'*-Bis-(3:4-dihydro-1:2-naphthacridine-**  
**14-carbonyl)ethylenediamine**, A., 523.  
*trans*-**Bisdi-indonylene**, and its derivatives,  
 A., 747.  
 **$\alpha\alpha$ -Bisdimethylaminomethylpropaldehyde**,  
 and  $\beta$ -hydroxy-, hydrochloride, A., 503.  
 **$\beta\beta$ -Bisdimethylaminomethylpropyl alcohol**,  
 and its derivatives, A., 504.  
 **$\omega\omega'$ -Bisdimethylamino- $\omega\omega'$ -xylylenebis-**  
**acetophenones**, 4:4'-*di*bromo-, A., 262.  
**S:4-Bisdiphenylmethyl- $\alpha$ -thionaphthol**, A.,  
 1027.  
**S:*p*-Bisdiphenylmethylthiophenol**, A., 1027.  
**Bis- $\alpha$ -dithienyloxindole**, A., 752.  
**Bis-5-hydroxy-2:4-dimethylpyrrole**, A., 1045.  
***NN'*-Bis-2-hydroxycyclohexylpiperazine**,  
 and its salts, A., 1042.  
***NN'*-Bis-2'-hydroxycyclohexyl-2:5-dimethyl**  
**piperazine**, and its chloroplatinate, A.,  
 1042.  
***NN'*-Bis-2-hydroxycyclohexylpiperazine**,  
 and its salts, A., 1042.  
***NN'*-Bis-(1-hydroxy-2-indanyl)piperazine**,  
 and its salts, A., 1042.  
***NN'*-Bis-2-hydroxycyclooctylpiperazine**, and  
 its salts, A., 1042.  
***NN'*-Bis-2-hydroxycyclopentylpiperazine**,  
 and its salts, A., 1042.  
***NN'*-Bis-*o*-hydroxyphenyloxamide**, and its  
 diacetyl derivative, A., 1244.  
***NN'*-Bis-(4-hydroxy-*m*-tolyl)oxamide**, A.,  
 1244.  
**Bis-3-indolylmethyl ether**, A., 1261.  
**3:3-Bis-(3':5'-*di*iodo-4'-hydroxyphenyl)ox-**  
**indole**, and *mono*- and *di*-iodo-, and their  
 acetyl derivatives, A., 1142.  
***NN'*-Bis-2-ketocyclohexylpiperazine**, and its  
 derivatives, A., 404, 1042.  
**Bis-(2-methyl-3-indolylmethyl) ether**, A.,  
 1261.  
**Bismethylmalonic acid**, A., 613.  
**Bismuth**, production of, (P.), B., 351.  
 refining of, (P.), B., 512.  
 separation of, from lead ores, (P.), B.,  
 471.  
 in spathic iron of Siegerland, A., 494.  
 recovery of, from zinc distillation residues,  
 (P.), B., 1123.  
 wavelength of spectrum of, A., 207.  
 ultra-violet spark spectrum of, A., 440.  
 effect of magnetic field on infra-red re-  
 flexion of, A., 1075.  
 Paschen-Back effect in, A., 208.  
 diamagnetism of, A., 449.  
 co-deposition of lead and, A., 1005.  
 atomic heat of, at higher temperatures,  
 A., 684.  
 molten, variation of electrical conduc-  
 tivity of, with bismuth chloride con-  
 tent, A., 110.  
 density and molecular weight of, A.,  
 905.  
 rate of diffusion of, into lead, A., 1195.  
 crystal structure of, A., 681.  
 crystals, magnetic properties of, A., 987.  
 thermo-electric power of, A., 1080.

- Bismuth crystals, Hall effect in, A., 904.  
thermal expansion of, A., 796.  
effect of torsional stress on, A., 452.  
influence of pressure and tension on specific resistance of, A., 13.  
equilibrium of, with oxygen and sulphur, A., 810.
- Bismuth alloys with aluminium, A., 685.  
with antimony, X-ray structure of, A., 567.  
with lead, refining of, (P.), B., 1088.  
conductivity of, A., 905.
- Bismuth compounds, water-soluble, pharmacology of, A., 541.
- Bismuth salts, diuresis from, A., 961.
- Bismuth hydride, spectrum of, A., 440.  
nitrate, dry, effect of heat on, A., 810.  
compounds of, with polyhydric alcohols, A., 22.  
alkali sulphates, A., 32.  
sulphide, thermochemistry of, A., 812.
- Bismuth organic compounds, production of, (P.), B., 1055.  
fat-soluble, preparation of, (P.), B., 129.  
with thiocarbamide, A., 114.
- Bismuth determination —  
determination of, A., 1224.  
as metal, A., 137.  
as phosphate in presence of organic compounds, A., 1012.  
in solutions of bismuth and ammonium citrate, B., 1119.  
in lead alloys, electrolytically, B., 1121.  
in the organism, and its elimination, A., 964.  
lipin-soluble, determination of, in oil solutions, A., 1070.
- Bismuthides, transformation of, into alloys, A., 455.
- 1:8-Bisnaphthaleneazo-2:7-di-hydroxynaphthalene-4':4''-disulphonic acid, and its derivatives, A., 264.
- 1:1'-Bisnaphthyl-5:5'-azotetrazoles, A., 1044.
- Bis-*p*-nitrobenzeneazofluoreseein, and its diacetyl derivative, A., 1141.
- Bis-(2:4-dinitrobenzeneazo)phenol, dinitro-, A., 53.
- Bis-*o*-nitrobenzylidene-*m*-phenylenediacetic acid, A., 1136.
- 2:2'-Bis-(3-oxy-2-methyl-1-thionaphthen), and its 1-dioxide, A., 65.
- Bisphenylmethylenepiperazines, stereoisomeric, and their salts and nitro-derivatives, A., 1042.
- 1:1'-Bis-*p*-phenetyl-5:5'-azotetrazole, A., 1044.
- 1:1'-Bis-*p*-phenetyl-5:5'-hydrazotetrazole, A., 1044.
- Bisphenylazomethine-*pp'*-distibinous oxide, A., 867.
- Bis- $\beta$ -phenylethyltrimethylarsonium iodomercurate, A., 1120.
- Bis-*N*-(phenylurethano)methylcarbinol, A., 1025.
- Bis(piperonyl)diketopiperazine, A., 1144.
- Bis(piperonylidene)diketopiperazine, A., 1144.
- Bispropionic acid, and its anhydride, A., 614.
- Bis-2'-pyridyl-2:6-pyridine. See 2:2':2''-Tri-pyridyl.
- 1:8-Bis-*p*-sulphobenzeneazo-2:7-di-hydroxynaphthalene, A., 264.
- Bistetramethylenepiperazines, and their salts and derivatives, A., 625, 756.
- Bistetramethylenepyrzazine, salts of, A., 625.
- $\alpha$ -Bisthiocarbonylacetone, A., 145.
- 1:2:3:4-Bis-(2':3')-thiochromonothioxanthone, A., 1259.
- 5:6:7:8-Bisthiopyranonothiochromanone, A., 1259.
- Bis-2:5-thioxenyl-(3)-oxindole, A., 752.
- Bis-*o*-tolueneazofluorescein, and its diacetyl derivative, A., 1141.
- S*:1-Bistriphenylmethyl- $\beta$ -thionaphthol, A., 1027.
- Bittersweet, oil from seeds of, A., 1179.
- Bitumen, formation of, from algae, B., 375.  
production of, from acid resin residues, (P.), B., 9.  
from sphagnum peat, B., 871.  
separation of, from asphaltic rocks of Ragusa, B., 246.  
from bituminous sands, etc., (P.), B., 538.  
hydrogenation of, B., 456.  
impregnation of fabrics with, for roofing materials, etc., (P.), B., 1076.  
use of, in paints, B., 70.  
asphalt, determination of, in mixtures with tar, B., 632.  
containing paraffin, properties of, B., 535.  
peat, fatty acids in, B., 326.  
resin, sterols of, B., 1014.  
penetration test on, B., 375.
- Bituminous compositions, (P.), B., 9, 829.  
materials, retorts for drying and distillation of, (P.), B., 829.  
coking of, (P.), B., 377, 874.  
ring-and-ball method for determination of softening point of, B., 134.  
manufacture of aqueous dispersions of, (P.), B., 171.  
increasing spreading capacity of, (P.), B., 136.  
coating of fabrics with, (P.), B., 798.  
for protection against corrosion, B., 1040.  
for jointing, (P.), B., 869.  
differentiation of, B., 760.
- Biuret, amino-, and its reaction with formaldehyde, A., 1239.
- Bixins, isomerisation of, A., 618.
- Blacks, mineral, treatment of, (P.), B., 1127.
- Blackberries, calcium in, A., 785.
- Blackcurrant juice, preserved, vitamins in, B., 784.
- Blanc fixe, manufacture of, (P.), B., 687.
- Blancometer, B., 314.  
matching of nearly white colours with, B., 731.
- Blatta orientalis*. See Cockroach.
- Bleaching, process for, B., 143.  
rate of oxidation action in, B., 1025.  
comparative heat effects on chlorine and bleaching powder processes of, B., 226.  
catalytic decomposition by metals of chlorine liquors for, B., 227.  
use of monel metal in equipment for, B., 639.  
of beeswax, (P.), B., 234.  
of cellulose pulp, (P.), B., 503.  
of cotton yarn, B., 721.  
of fabrics, machines for, (P.), B., 597.  
of woven fabrics, etc., apparatus for, (P.), B., 99.  
of fibres, (P.), B., 721.  
of fibrous materials and liquids therefor, (P.), B., 19.  
of flax, hemp, and other bast fibres, (P.), B., 596.  
of furs, etc., (P.), B., 226, 503.  
of kraft pulp, B., 673, 880.  
of oils, fats, and waxes, (P.), B., 947.  
of rag half-stuff, B., 931.  
of textile fibres with gases, (P.), B., 676.  
of sulphite wood pulp with chlorine, B., 502.
- Bleaching of wood pulp with chlorine, B., 178.  
alkalinity in, B., 596.  
of yarn packages, (P.), B., 337.  
determination of  $p_H$  of solutions in, with the glass electrode, B., 1075.
- Bleaching agents, production of, (P.), B., 63.
- Bleaching liquors, manufacture of, use of liquid chlorine in, B., 178.  
determination of, of hydrogen peroxide, B., 336, 502.
- Bleaching materials, determination of available chlorine in, B., 723.
- Bleaching powder, manufacture of, B., 504; (P.), B., 506, 981.  
application of co-ordination theory to chemistry of, B., 1120.  
stability of solutions of, B., 798.
- Blende, magnetic rotation of, to measure field strength of electro-magnets, A., 323.  
piezo-electric modulus of, A., 683.  
crystal photo-effect in, A., 1190.
- Blight, red leaf, control of, with sulphur, B., 277.
- Blood, action of iron on formation of, A., 1052.  
enumeration of platelets and reticulocytes in, A., 1271.  
constituents of, in hibernation, A., 772.  
effect of tissue constituents on circulation of, A., 965.  
device for collection of suspended particles from, (P.), B., 1137.  
optical activity of filtrates of, A., 1053.  
effect of X-rays on constituents of, A., 542.  
loss of mitogenetic rays by, on keeping or on irradiation, A., 1273.  
calorimetry of, in health and disease, A., 411.  
corpusecular volume of, A., 870.  
coagulation of, A., 293, 532, 869, 870, 1273.  
physics of, A., 957.  
relation of, to sugar, A., 1273.  
preparation of substances for stopping, (P.), B., 80.  
concentration of complement in, A., 184.  
adenine-nucleotide in, A., 531.  
effect of insulin on formation of albumin in, A., 886.  
species differences in alkali reserve of, A., 411.  
amino-acids in, A., 299.  
formation of ammonia in, A., 1272.  
bile salts in, A., 633.  
bismuth content of, A., 541.  
bromine content of, A., 876.  
calcium in, after injection of calcium salts, A., 192.  
stability of, A., 533.  
in fasting, A., 764.  
effect of ultra-violet light and of parathyroidectomy on, A., 1164.  
effect of fluorides and oxalates on, A., 426.  
carbon dioxide in, A., 182, 1270.  
carbon dioxide tension in, A., 411.  
influence of narcotics on catalase of, A., 1162.  
effect of sodium chloride on activity of catalase in, A., 74.  
chlorides and sugar in, A., 764.  
chlorine in, during asphyxiation, A., 412.  
changes in chlorine and water of, with oxygen deficiency, A., 635.  
cholesterol in, A., 780, 956.  
in health and with sarcoma, A., 296.  
and basal metabolism, A., 1160.  
effect of caseinogen on, A., 1171.  
effect of thyroid on, A., 1068.

Blood, copper content of, A., 183.  
 optical rotation of dextrose in, A., 293.  
 variation of diastase in, A., 1053.  
 ergothioneine from, A., 869.  
 esterase in, A., 1273.  
 fat and lipins in, in hepatic injury, A., 81.  
 influence of lungs on volatile fatty acids in, A., 1160.  
 fluorine in, in hæmophilia, A., 1158.  
 fructose content of, A., 956.  
 decomposition of glucose in, A., 182.  
 absence of  $\gamma$ -glucose from dialysates of, A., 633.  
 glutathione in, A., 634.  
 in dermatoses, A., 1157.  
 effect of glutathione on reduction and rotation of filtrates of, A., 869.  
 glycolysis in, A., 1273.  
 effect of arsenates on, A., 530, 1273.  
 formation of hexosephosphoric acids in, A., 956.  
 hexosephosphoric acids in, A., 1273.  
 $p_H$  and carbon dioxide tension in, A., 530.  
 effect of bile acids on  $p_H$  of, A., 635.  
 invertase in, after injection of sucrose, A., 293.  
 iodine in, A., 1285.  
 effect of adrenaline on, A., 885.  
 iodine index for, A., 764.  
 lactic acid in, during hepatic disturbance, A., 536.  
 effect of narcosis on, A., 191.  
 lactic acid and other ether-soluble acids in, A., 421.  
 effect of administration of pancreatic lipase on lipase in, A., 183.  
 lipins in, A., 535.  
 effect of diet on, A., 538.  
 influence of fat deprivation and feeding on distribution of, A., 75.  
 amide-nitrogen of, A., 635.  
 effect of kidneys on elimination of phenols from, A., 962.  
 effect of liver on elimination of phenols from, A., 962.  
 effect of olive oil on phosphatides and cholesterol in, A., 1058.  
 phosphorus in, A., 293, 956.  
 in health and rickets, A., 1057.  
 effect of X-ray therapy on, in disease, A., 82.  
 phosphorus organic compounds in, A., 1053.  
 polypeptides in, in serum and histamine shocks, A., 301.  
 pressor substance in, in pregnancy, A., 536.  
 action of phenylhydrazine on proteins of, A., 1271.  
 plasma-proteins in relation to hydration of, A., 642.  
 reducing substances of, A., 764.  
 effect of irradiation on, A., 90.  
 non-glucose reducing substance in, A., 960.  
 relation of silica in, to parathyroids and blood-calcium, A., 1068.  
 curves of sodium and sugar in, A., 869.  
 sugar in, A., 74.  
 distribution of, A., 413, 956.  
 in abnormal mental states, A., 633.  
 effect of adrenaline on, A., 885.  
 effect of amino-acids on, A., 764.  
 in anaesthesia, A., 301.  
 effect of administration of dextrose on, A., 413, 962.  
 effect of injection of diastase on, A., 1054.  
 glutathione substance in, A., 74.  
 structures produced in cultures of, by hydrogen peroxide and mercury, A., 969.

Blood, sugar in, relation of lactic acid in brain to, A., 637.  
 influence of proteins, amino-acids and their derivatives on, A., 1054.  
 effect of tobacco smoke on, A., 1284.  
 bound sugar of, A., 413.  
 combined sugar in tungstic acid filtrates of, A., 75.  
 thiocyanic acid in, A., 633.  
 urea in, in abnormal mental states, A., 873.  
 lowering of pressure of, by urine, A., 1284.  
 action of vitamin preparations on bactericidal power of, A., 658.  
 chemical changes during preservation of, A., 1152.  
 pipette for sampling of, A., 182.  
 Blood, of animals, lactic acid in, A., 645.  
 phosphorus partition of, A., 413.  
 camel's, composition of, A., 74.  
 chicken's, phosphorus in, in relation to diet, A., 956.  
 children's, amide-nitrogen in, A., 635.  
 calcium and phosphorus distribution in, A., 418.  
 phospholipins in, A., 640.  
 cow's, chemistry of, in relation to milk-fever, A., 642.  
 changes in, at calving, A., 1272.  
 during pregnancy and delivery, A., 961.  
 hæmoglobin content of, A., 955.  
 sugar in, A., 764.  
 of dairy cattle, variations in calcium in, A., 75.  
 variations in inorganic phosphorus in, A., 75.  
 of dairy heifers, sampling of, for phosphorus content, A., 1152.  
 of decapods, sugar in, A., 765.  
 dog's, A., 411.  
 calcium content of, A., 1152.  
 distribution of potassium in, A., 1272.  
 of depancreatized dogs, hyperglycæmic activity of, A., 81.  
 of marine fish, calcium content of, A., 183.  
 foetal, A., 183.  
 hen's, hæmoglobin content of, A., 868.  
 human, effect of muscular work on creatine and creatinine in, A., 422.  
 distribution of glucose in, A., 1152.  
 determination in, of chlorides, A., 1052.  
 of the new-born, coagulation of, A., 957, 1054.  
 normal and diabetic, distribution of sugar in, A., 81.  
 pig's, calcium and phosphorus content of, A., 1152.  
 rabbit's, effect of adrenalectomy on, A., 417.  
 of pregnant rats and those with tumours, cholesterol in, A., 959.  
 of normal and cholera-infected swine, A., 1157.  
 of temperate and tropical people, iron content of, A., 292.  
 tortoise's, formation of ammonia in, A., 869, 1054.  
 unalaked, filtration of protein tungstate precipitates from, A., 956.  
 venous, effect of glutathione on oxygen tension of, A., 1156.  
 Blood detection and determination :—  
 analysis of, A., 412.  
 detection of, A., 182, 1271.  
 with "hyperol," A., 1151.  
 detection in, of formic acid, A., 1154.  
 determination in, of alkali reserve, A., 76.  
 of ammonia, A., 957.

Blood detection and determination :—  
 determination in, of "avertin," A., 301.  
 of bile acids, A., 1053.  
 of bromide, A., 412.  
 of calcium, A., 293, 531, 1272.  
 of carbon monoxide, A., 633.  
 of carbon dioxide and oxygen, A., 72.  
 of catalase, A., 530.  
 of chlorides, A., 531.  
 of cholesterol, A., 75, 636, 868.  
 apparatus for, A., 1272.  
 of creatinine, in diabetes, A., 297.  
 of ethyl alcohol, A., 540.  
 of galactose, A., 183.  
 of glutathione, A., 531, 1053, 1152.  
 of oxidised glutathione, A., 74.  
 of glycuronic acid, A., 640.  
 of hippuric acid, A., 1276.  
 of anterior pituitary hormone, A., 885.  
 of hydrogen ions, A., 635.  
 of iodine, A., 1272.  
 of iron, A., 635, 764, 1152.  
 of ketone substances, A., 1272.  
 of ketonic substances and lactic acid, A., 1152.  
 of lactic acid, gasometrically, A., 75.  
 of lævulose, A., 1054.  
 of lecithin, A., 75.  
 of lipin-phosphorus, A., 1272.  
 of magnesium, A., 764.  
 of residual nitrogen, A., 635, 1152.  
 of nucleotides, A., 1273.  
 of peroxidase, A., 412.  
 of phenols, A., 1271.  
 of phosphorus, A., 531.  
 of proteins, A., 1271.  
 of solids, A., 1272.  
 of sugar, A., 869, 1054, 1154.  
 by the picric acid method, A., 75.  
 without yeast, A., 75.  
 of urea, A., 293, 531.  
 Blood-agar, formation of ring structures in, A., 1291.  
 structures produced in, by electric currents between gold and platinum electrodes, A., 1291.  
 Blood-corpuscles, f.p. of, A., 956.  
 absorption of nutrients and hormones by, A., 198.  
 effect of hæmolytics on rate of sinking of, A., 76.  
 hæmolysis of, by staphylo toxin, A., 430.  
 effect of vitamin-B deficiency on number of, A., 548.  
 magnesium content of, after injection of prolan, A., 1068.  
 protein of membrane and stroma of, A., 1271.  
 non-protein sulphur content of, A., 633.  
 red, composition of membranes of, A., 1151.  
 permeability of, A., 633.  
 rate of sinking of, A., 633.  
 uptake of carbon monoxide and oxygen by, A., 763.  
 volume and hæmoglobin content of, A., 872.  
 activation of hexosephosphoric acid in, A., 74.  
 isolation of lactic enzyme from, A., 542.  
 action of phenylhydrazine and phenylhydroxylamine on metabolism of, A., 73.  
 bird's, relation between respiration and pyrophosphate exchange in, A., 1052.  
 human, calcium content of, A., 531, 1052.  
 white, influence of sulphur on formation of, A., 868.

- Blood-corpuseles**, white, mitogenetic radiation from, A., 1062.  
catalase content of, A., 412, 1151.  
enzymes of, A., 292, 956.  
of various animals, proteolytic enzymes of, A., 1052.
- Blood pigments**, determination of, spectrophotometrically, A., 1270.
- Blood-plasma**, determination of volume of, A., 73.  
catalase of, A., 765.  
removal of lipins from, A., 636.  
proteins of, A., 293.  
effect of bleeding on protein concentration in, A., 1053.  
racemisation curves of proteins of oedema fluid, urine and, A., 642.  
of dairy cattle, biometry of calcium and inorganic phosphorus in, A., 76.  
frog's, reducing power of, A., 956.  
horse's,  $\beta$ -*h*-fructosidase in, A., 1053.  
human, bound sugar in, A., 413.  
of albino rats, nitrogen of, A., 1152.  
determination in, of albumin, fibrin, and, globulin, A., 183.
- Blood-serum**, f.p. of, A., 956.  
osmotic action of water of, A., 635.  
changes in, by injection of serum and by plasmatic bleeding, A., 764.  
changes in calcium and phosphorus in, A., 190.  
atoxyl-resisting lipase in, A., 872.  
urobilinogen in, A., 412.  
human, antitryptic factor in, A., 74.  
rabbit's, defence enzymes in, A., 1153.  
rat's, concentration of calcium and of phosphorus in, A., 962.  
determination in, of amino-acids, A., 183.  
of bilirubin, A., 1272.  
of calcium, cholesterol and phosphorus, A., 75.  
of magnesium, A., 531.  
of sodium, A., 1152.  
of inorganic sulphates, A., 869.
- Blueberries**, control of maggots in, in Washington County, Maine, B., 571.
- Bluegrass**, fertilisers for, B., 954.
- Board**, artificial, plastic materials for manufacture of, (P.), B., 902.  
binders', physical properties of, B., 1074.  
synthetic wood pulp, production of, (P.), B., 148.
- Boats**, varnishes for, B., 356.
- Body**, metabolic regulation of temperature of, A., 420.  
desiccation of, A., 1283.
- Bog-moss**, A., 889.
- Boilers**, automatic remote control of, B., 243, 371.  
steam dryer for, (P.), B., 822.  
solid fuels for, B., 534.  
device for attachment to, for burning of wet fuels, (P.), B., 1012.  
heat-insulating laggings for, (P.), B., 1060.  
foaming of water in, B., 451.  
use of alkaline feed water in, B., 787.  
treatment of feed-water for, (P.), B., 1060.  
analytical control of water-softening plant for, B., 483.  
use of sodium phosphate in, B., 963.  
prevention of scale in, (P.), B., 579.  
by removal of oxygen, B., 755.  
water constituents causing scale in, B., 819.  
removal of scale-forming material from, (P.), B., 404.
- Boilers**, effect of finely-ground materials on formation of scale in, B., 915.  
extract of seeds for removal of scale from, (P.), B., 1013.  
slime in, B., 483.  
caustic embrittlement of steel plates of, B., 386.  
locomotive, combustion of pulverised fuels in, (P.), B., 292.  
marine, fresh water as remedy for corrosion of, B., 243.  
steam, (P.), B., 9.  
control of salinity of water in, (P.), B., 1013.  
control of sludging of, (P.), B., 324.  
treatment of water for, (P.), B., 324.
- Boiling point**, determination of, A., 1013.  
relation between constitution and, A., 13, 111, 901, 1194.  
of metals and alloys, A., 219.
- Boletus edulis***, growth-promoting substance in, A., 887.
- Boltongeta wood**, composition of, B., 385.
- Bombichlorin**, A., 871.
- Bombyx mori***. See Silkworms.
- Bone**, structure and composition of, A., 359.  
composition of ash of, A., 78.  
ash content of metaphyses and shafts of, A., 78.  
solubility of, in magnesium salt solutions, A., 78.  
solvent action of blood-serum on, in health and rickets, A., 1057.  
availability of calcium for formation of, in growing chicks, A., 773.  
calcium salts of, A., 185.  
effect of ingestion of irradiated ergosterol on, A., 312, 658.  
phosphatase and pyrophosphatase of, A., 870.  
effect of avitaminosis-A and -B on, A., 1293.  
treatment of, before deglueing, (P.), B., 360, 742.  
human, lead content of, A., 294.  
detection of benzene in extraction apparatus for, B., 354.
- Bone black**, regeneration of, B., 967.
- Bone-china ware**. See under China ware.
- Bone marrow** in cancer, potassium content of, A., 186.
- Bonellia viridis***, masculinisation of larvæ of, by traces of copper, A., 877.
- Borates**. See under Boron.
- Borax**. See Sodium borate.
- Boric acid**. See under Boron.
- Borides**, superconductivity of, A., 565.
- Borneol**, effect of solvents on optical rotation of, A., 448.  
catalytic formation of camphor from, A., 165.  
3:5-dinitrobenzoate, A., 165.  
phosphates, A., 92.
- i*-Borneol**, dipole moment of, A., 677.
- iso*Borneol**, synthesis of, A., 1037.
- Bornyl dioxanthide**, effect of solvents and temperature on optical rotation of, A., 561.  
hydrolysis and decomposition of, A., 498.
- d*-Bornyl triphenyl methyl ether**, A., 255.
- Bornylaniline**, constitution of, A., 1037.
- iso*Bornylaniline**, and its salts and derivatives, A., 398.
- Bornylene**, effect of solvents on optical rotation of, A., 448.  
nitrosite, rotation dispersion of, A., 447.
- apo*Bornylene**, A., 1037.
- Boro-molybdic blue**, A., 708.
- Boron**, chemistry of, A., 919.
- Boron**, second spark spectrum of, A., 103.  
two-electron spectrum of, A., 207.  
 $\gamma$ -rays from, A., 210, 671, 895.  
absorption of neutrons from, by lead, A., 1073.  
neutrons from, excited by radon, A., 895.  
quinkevalent, A., 761.
- Boron alloys**, manufacture of, (P.), B., 989.
- Boron tribromide**, A., 132.
- carbide**, manufacture of alloys of, (P.), B., 989.
- trichloride**, action of substituents on, A., 258.  
additive compounds of, with arsine and phosphine, A., 1218.
- trifluoride**, preparation, vapour pressure and density of, A., 707.  
band spectrum of, A., 319.  
critical constants and vapour pressure of, A., 800.  
saturation pressures of, A., 1008.  
reactions of, A., 728, 735, 1125.  
with alcohols and glycols, A., 583.  
compounds of, with methyl salicylate and glycolate, A., 728.  
parachor of additive compounds of, A., 680.
- halides**, dipole moments of, and their molecular compounds, A., 447.
- hydronitride**, constitution of, A., 215.
- hydrides**, A., 350.
- oxychloride**, A., 258.
- Boric acid**, removal of sodium sulphate in manufacture of, from kernite and rosarite, B., 545.  
influence of  $\alpha$ - and  $\beta$ -hydroxy-acids on conductivity of, A., 23.  
equilibria of, with diols and water, A., 228.  
with hydroxy-acids and water, A., 1204.  
titration of, by sodium hydroxide, A., 1222.  
determination of, A., 354.  
electrometrically, A., 242.  
volumetrically, A., 587.
- Borates**, isomorphism of, A., 1079.
- Boron organic compounds**, A., 258.
- Boron determination** :—  
determination of, spectroscopically, A., 1221.  
in its ores, etc., B., 841.  
in organic compounds, A., 1269.  
in soils, B., 617.  
in water, A., 242.
- Boswellic acids**, and their derivatives, A., 856.
- Bottles**, determination of degree of cleanliness of, B., 820.
- Bonmonite**, crystal structure of, A., 987.
- Brachyrrhinus sordatus***, as a conifer pest, B., 1130.
- Bracken**, eradication of, B., 955.
- Brain**, constituents of, in hibernation, A., 772.  
dehydrogenation by, A., 1286.  
nutrition in relation to, A., 765.  
oxidation by, A., 874.  
antagonistic action of calcium and magnesium on, A., 89.  
effect of narcotics on, A., 1284.  
effect of alcohol on oxygen uptake by, A., 647.  
reducing substances in, A., 1154.  
influence of insulin on ammonia production in, A., 1059.  
effect of narcotics on ammonia production and oxygen consumption in, A., 424.  
chemistry of antigen of, A., 765.



- Brain**, relation between lactic acid in, and blood-sugar, A., 637.  
oxidation of lactic acid by tissues of, A., 188.  
unsaturated fatty acids of phosphatides of, A., 636.  
human, ammonia in, A., 1059.  
dihydrocholesterol in, A., 293.  
kephalin from, A., 415.  
phosphatides of, A., 958.  
ox., unsaturated fatty acids of, A., 957.
- Brakes**, friction materials for, (P.), B., 407, 756, 1013.
- Brake linings**, manufacture of, (P.), B., 325.  
material for impregnation of, (P.), B., 220.
- Bran**, phosphatase from, A., 650.  
prepared, effect of, on hæmoglobin regeneration, A., 868.
- Brandy**, water for blending of, B., 1133.  
cider, characteristics of, B., 1133.  
corn, definition of, B., 747.  
wine, law of mass action for, B., 364.  
evaluation of, B., 43.
- Brass**, strength of, at high temperatures, B., 1034.  
effect of products of combustion on shrinkage of, B., 347.  
influence of lead and antimony on working of, B., 985.  
electrodeposition of, from cyanide solutions, B., 681.  
from thiocyanate solutions, B., 387.  
complex cyanides in solutions for plating with, B., 892.  
electroplating of iron with, (P.), B., 351.  
coating of iron articles with, (P.), B., 512.  
adhesion of electrodeposited nickel to, B., 606.  
for condenser tubes, (P.), B., 512.  
alloy, A., 455.  
influence of other metals on constitution of, A., 686.  
bearing, manufacture of, (P.), B., 988.  
cartridge, effect of cold-rolling and annealing on solubility of, in chromic acid, B., 470.  
red, solidification of, B., 509.  
scrap, recovery of metals from, (P.), B., 388.  
coalescing of, (P.), B., 988.  
determination in, of sulphur, B., 310.  
of tin, B., 149.  
of zinc, B., 986.
- $\alpha$ -Brass**, annealing and grain growth characteristics of, B., 940.
- $\beta$ -Brass**,  $\alpha$ -phase in, A., 1078.
- $\zeta$ -Brass**, electrodeposition of, A., 1096.
- Brassica oleracea**. See Kale.
- Braunite**, synthesis of, A., 1229.
- Brazing**, flux for, (P.), B., 894.
- Bread**, making of, B., 431; (P.), B., 816.  
physical chemistry of, A., 338.  
stimulation of sugar production in, (P.), B., 816.  
use of cooked potatoes with fermentable sugars in, B., 655.  
treatment of yeast for, (P.), B., 958.  
baking of, (P.), B., 912.  
temperature of, B., 44.  
use of cooked potato in, B., 444.  
relations of crumb texture and colour of, B., 621.  
nutritive value of, A., 644.  
bromine in, A., 205.  
relations of non-protein nitrogen compounds in cereals to nitrogen factor for proteins in, B., 747.  
hydrolysis of starch in, by flour and malt amylase, B., 747.
- Bread**, pasting of starch in, B., 1004.  
improvement of vitamin content of, with brewery yeast, B., 445.  
vitamin-B in, B., 621.  
mould in, B., 365.  
rope control in, B., 621.  
rye, detection in, of salicylic acid, B., 393, 525.  
determination of acidity of, B., 365.
- Bremen-blue**, and its substitutes, B., 1090.
- Breweries**, analysis of deposits in coolers in, B., 814.  
rubber hose for use in, B., 365.  
preparation of new drinks in, B., 619.
- Brewing**, apparatus for, (P.), B., 239.  
use of solid carbon dioxide in, B., 933.  
manioc for, B., 204.  
conditioning of water for, (P.), B., 1004.  
underground water supplies in Midlands for, B., 747.  
addition of wood chips in, B., 319.
- Bricks**, manufacture of, (P.), B., 182, 425, 983.  
from clay, (P.), B., 938.  
from fireclay or shale, (P.), B., 106.  
apparatus for, (P.), B., 550.  
artificial weathering of, (P.), B., 642.  
building, manufacture of, (P.), B., 1033.  
relation between percentage absorption, modulus of rupture, and electrical conductivity of, B., 1081.  
chamotte, B., 1120.  
chequer, heating and cooling rates of, B., 1080.  
facing, staining of, B., 679.  
fire. See Fire bricks.  
Fletton, effect of dissolution on durability of, B., 344.  
glazed, manufacture of, (P.), B., 727.  
grey, production of, B., 105.  
heat-insulating, testing of, B., 424.  
insulating, manufacture of, (P.), B., 601.  
irregularly-serrated, manufacture of, (P.), B., 508.  
light, nailable, production of, (P.), B., 938.  
magnesite, X-ray examination of, B., 229.  
souring of, B., 936.  
insensitive to temperature changes, B., 842.  
for use in metallurgy, B., 307.  
refractory, manufacture of, (P.), B., 467, 549, 642.  
from zirconium ores, B., 64.  
with recessed firebricks, (P.), B., 549.  
for roofs of electric furnaces, B., 1031.  
sand-lime, influence of autoclave conditions on strength of, B., 424.  
silica, manufacture of, (P.), B., 507.  
from chalk flints, B., 63.  
effect of grading on porosity of, B., 63.  
effect of iron oxide on rate of inversion of quartz in, B., 63.  
for coke ovens, B., 842.  
lime-bonded, influence of titanium dioxide on rate of quartz inversion in, B., 63.  
lime-bonded and clay-bonded, from calcined ganister, B., 63.  
lime- and lime-clay-bonded, influence of iron oxide on rate of quartz inversion in, B., 63.  
made from Sharon conglomerate, B., 307.  
slag, manufacture of, (P.), B., 889.  
stiff-plastic, manufacture of, B., 1080.
- Bright's disease**, nitrogen and sulphur metabolism in, A., 80.  
urea clearance test in, A., 1279.
- Brine**, purification of, for Solvay process, B., 101.  
treatment of, (P.), B., 678.  
recovery of bromine and iodine from, (P.), B., 1079.  
removal of calcium and magnesium salts from, B., 20.  
removal of sulphates from, B., 144.  
total solids in, B., 597.  
production of salts from, (P.), B., 304.  
non-corroding, for refrigerators, etc., (P.), B., 1028.  
Searles Lake, treatment of, (P.), B., 724.
- Briquettes**, production of, (P.), B., 760.  
fuel, (P.), B., 135, 170.  
materials for, B., 820.  
coal, production of, (P.), B., 537, 873.  
fuel, ovens for carbonisation of, (P.), B., 54.
- Brittleness**, B., 451.
- Bromal**, condensation of, with carbamide, A., 1114.  
with nitroanilines, A., 1124.
- Bromates and Bromides**. See under Bromine.
- Bromine**, preparation of, iodine-free, A., 485.  
recovery of, from brine, (P.), B., 1079.  
from its salts, (P.), B., 1029.  
absorption spectrum of, A., 439.  
arc spectrum of, A., 787.  
entropy of, A., 906.  
diffusion coefficients of, with other gases, A., 1081.  
equilibrium of, in bromide solutions, A., 338.  
thermal decomposition of ethylene and, A., 819.  
in plants, A., 785.  
water, velocity of solution of metals in, A., 1094.  
metabolism. See under Metabolism.
- Bromine chloride**, rate of formation of, from its elements, A., 127.  
chloride hydrate, A., 585.  
trifluoride, preparation, vapour pressure and density of, A., 707.  
pentafluoride, A., 133.  
hydrate, A., 352.
- Hydrobromic acid**, quantitative measurement of absorption spectrum of, A., 981.  
crystal structure of, A., 325.  
oxidation of, by hydrogen peroxide, A., 703.  
reduction of vanadic acid by, A., 576.  
thermal reaction of, with ozone, A., 701.
- Bromides**, retention of, A., 639.  
effect of injection of, on blood and urine, A., 302.  
detection of, colorimetrically, A., 824.  
determination of, in presence of chlorides, A., 921.  
in presence of chlorides and iodides, A., 487, 824.  
in blood and urine, A., 412.
- Bromates**, use of, in volumetric analysis, A., 137.  
detection of, A., 486.
- Bromine organic compounds** :—  
**Bromides**, preparation of, from amines, phosphorus trichloride and bromine, A., 717.
- Bromine determination** :—  
determination of, acidimetrically, A., 631.  
potentiometrically, A., 587.  
in organic compounds, A., 291, 529.  
in organic substances, A., 709, 1149.
- Bromocresol green**, dissociation constant of, in potassium chloride solutions, A., 809.

Bromodiborane, A., 350.  
 Bromoform, physical properties of mixtures of, with acetone, A., 801.  
   reaction of, with magnesium, in ethereal solution, A., 717.  
 Bromo-hydrocarbons, action of sodamide on, A., 152.  
 $\alpha$ -Bromo-ketones, action of, with magnesium organic halides, A., 616.  
 Bromothymol-blue, effect of supersonic radiation on, A., 1215.  
 Bromoural, detection of, B., 702.  
 Bronze, welding of, with cast iron, B., 386.  
   for welding, (P.), B., 1087.  
   corrosion of, by vinegar, B., 845.  
   production of colours from, (P.), B., 154, 267.  
   production of porous bodies from, (P.), B., 311.  
   acid, preparation of, B., 1084.  
   bearing, effect of antimony on mechanical properties of, B., 729.  
     effect of casting temperatures and of iron on, B., 428.  
   cast, solidification temperature of, B., 509.  
   cold-rolled and annealed, directional properties in, B., 1084.  
   leaded, oxidation as cause of porosity of, B., 27.  
   old, analyses of, B., 386.  
   prehistoric, composition of, B., 348.  
   from the Royal Graves at Ur, B., 428.  
   scrap, recovery of metals from, (P.), B., 388.  
     coalescing of, (P.), B., 988.  
   white, (P.), B., 684.  
   determination in, of sulphur, B., 310.  
   of tin, B., 149.  
   See also Phosphor-bronze.  
 Bronzite from the Bonin islands, structure of, A., 1079.  
 Brookite, crystallography of, A., 715.  
 Brownian motion, laws of, A., 461.  
   in gases, device for showing, A., 1105.  
*Brucella*, identification of, A., 1169.  
 neoBrucidine, A., 528.  
 Brucidinolic acid, A., 407.  
 Brucine, A., 167, 178, 406, 527, 628, 1147.  
   constitution of, A., 953.  
   oxidation products of, A., 953.  
   additive compounds of, A., 629.  
   derivatives of, from action of cyanogen bromide, A., 866.  
 Brucine, oximino-, A., 629.  
 neoBrucine, A., 528.  
 Brucine series, oxidations in, A., 407.  
 Brucinesulphonic acid, relationship of, to strychninesulphonic acid, A., 953.  
 Brucinium salts, quaternary, oxidation of, A., 953.  
 Brucinolic acid, derivatives of, A., 953.  
 Brucinonic acid, esterification of, A., 407.  
   oxidation of, by barium peroxide, A., 866.  
   derivatives of, A., 953.  
 Brucite, dehydration of, A., 811.  
 Brushite, nomogram for solubility of, in sodium chloride solutions, A., 828.  
 Brussels sprouts, wax metabolism in leaves of, A., 660.  
 Bucherer's reaction, A., 842.  
 Buckwheat, milling of, B., 283.  
 Bufagin, A., 397.  
 Buffalo, American, milk of. See under Milk.  
 Buffer solutions,  $p_H$  and temperature in, A., 1000.  
   potential measurement with, A., 813.  
   acetate, adsorption of, on "carbo medicinalis," A., 458.  
 isoBufocholanic acid, A., 397.

Bufoalanone, A., 397.  
 Bufoalienone, A., 397.  
 Bufotalin, degradation of, A., 397.  
 Bufotenins, flavianates of, A., 1142.  
 Bugs, bed, action of ethylene oxide on different species of, B., 318.  
 Building blocks, manufacture of, (P.), B., 642, 679, 1082.  
   light, production of, (P.), B., 984.  
 Building materials, (P.), B., 184, 938.  
   apparatus for manufacture of, (P.), B., 508.  
   from blast-furnace slag, B., 1120.  
   waterproofing of, (P.), B., 508, 727.  
   for expansion joints, etc., (P.), B., 26.  
   acoustical, manufacture of, (P.), B., 107.  
   cellular, manufacture of, (P.), B., 468.  
   clay, standard specifications for, B., 1033.  
   coloured surface, manufacture of, (P.), B., 26.  
   light, manufacture of, (P.), B., 889, 984.  
   plastic and waterproof, manufacture of, (P.), B., 1033.  
   porous, manufacture of, (P.), B., 984.  
     from slag, (P.), B., 425.  
     properties of, B., 263, 424, 772.  
     solidification of, (P.), B., 727.  
   waterproof, production of, (P.), B., 938.  
   plastic production of, (P.), B., 550.  
   determination in, of free calcium oxide and hydroxide, B., 344.  
 Bulbs, effect of radioactivity on germination of, A., 661.  
 Bultfontein, South African, A., 1015.  
 Bunt, control of, B., 124.  
   effect of delayed planting on, by copper carbonate dusts, B., 954.  
   effect of  $p_H$  on adsorption of mercuric chloride by seeds in, B., 202.  
 Burettes, specification for, A., 924.  
   tap for, A., 925.  
   apparatus for reading, A., 924.  
   automatic, A., 1014.  
   gas. See Gas burette.  
   micro-, A., 925.  
 Burkeite, manufacture of, (P.), B., 599.  
 Burners for microsublimation, A., 592.  
   for hydrocarbons, (P.), B., 11.  
   oil, (P.), B., 378, 972.  
   gaseous fuel. See Gas burners.  
   liquid fuel, (P.), B., 11, 137, 414, 831.  
   powdered fuel, (P.), B., 172, 414, 831, 1019.  
   burning of sulphite-pulp residue in, B., 966.  
 Bush sickness, A., 959.  
   feeding with iron in, A., 80.  
*Busycon carnaliculatum*, oxygen dissociation constant of haemocyanin of, A., 1270.  
 Butadiene, "dien"-syntheses with, A., 55.  
   influence of methyl and phenyl substitution on polymerisability of, A., 496.  
   action of diazo-compounds on, A., 754.  
 $\Delta\alpha\beta$ -Butadiene,  $\delta$ -chloro-, A., 1231.  
 $\Delta\gamma\gamma$ -Butadiene, thermal polymerisation of, A., 1209.  
 $\Delta\alpha\gamma$ -Butadiene,  $\beta$ -chloro-, and its polymers, B., 156.  
 Butadiene- $\alpha$ -carboxylic acids, hydrogenation of, catalytically, A., 365.  
 Butaldehyde, production of, from crotonaldehyde, (P.), B., 763.  
 Butaldehyde,  $\beta$ -bromo-, A., 606.  
 isoButaldehyde nitrophenylhydrazones, A., 65.  
 Butane, thermal decomposition of, A., 597.  
   use of, as fuel in ceramic kilns, B., 1016.  
 Butane,  $\alpha\beta\gamma\delta$ -tetrabromo-, A., 597.  
   octachloro-, A., 831.  
    $\alpha$ -pentachloro-, A., 717.

Butanes, chloro-, thermal decomposition of, A., 1016.  
 $\alpha$ -cycloButane-1:2-dicarboxylanilide, A., 746.  
 Butane- $\alpha\delta$ -diol,  $\beta$ -chloro- $\beta$ -nitro-, and  $\beta$ -nitro-, sodium salt, A., 497.  
 $\gamma$ -Butane- $\alpha\gamma$ -diol, and its diphenylurethane, A., 143.  
 Butanesulphonyl bromide, A., 1018.  
 $n$ -Butane- $\alpha\beta\gamma\delta$ -tetracarboxylic acid, esters of, A., 1127.  
 cycloButane-1:2:3:4-tetracarboxylic acid, and its derivatives, A., 739.  
 cycloButanone, synthesis of, A., 161.  
 2:4-dinitrophenylhydrazones, A., 1249.  
 Butene. See Butylene.  
 $\Delta\beta$ -Butenoic acids,  $\alpha$ -hydroxy-, acetyl derivatives, isomeric, ethyl esters, A., 600.  
 Butenitrile. See Allyl cyanide.  
 Butenonitriles, A., 1119.  
 $\Delta^a$ -Butinine, preparation and physical properties of, A., 40.  
 $\Delta^a$ -Butinine- $\alpha\delta$ -dicarboxylic acid, ethylester, A., 1247.  
 isoButoxyacetic acid, and its esters and chloride, A., 1019.  
 $\alpha$ -Butoxybenzhydramines, and their hydrochlorides, A., 52.  
 $\alpha$ -Butoxybenzophenones, and their derivatives, A., 52.  
 Butoxyethyl arsenite, A., 937.  
 $\alpha$ -Butoxyethylcarbamide,  $\beta\beta\beta$ -trichloro-, A., 151.  
 $n$ -Butoxymethyl methyl and ethyl ethers, A., 1233.  
 4-Butoxypyridine-2:6-dicarboxylic acid, 3:5-diiodo-, and its methyl ester, A., 622.  
 Butter, manufacture of, (P.), B., 435, 526.  
   chemistry of, and its manufacture, B., 284.  
   salting of, B., 861.  
   wrapping of, in parchment paper, B., 816.  
   fluorescence of, in ultra-violet light, B., 655.  
   influence of feeding-stuffs on consistency of, B., 159.  
   effect of starters on keeping quality of, B., 78.  
   growth of bacteria and yeast in, in relation to  $p_H$ , B., 45.  
   origin of diacetyl in, B., 445.  
   inactivation of lipase in, by heavy metals, A., 1288.  
   effect of ultra-violet light on vitamin-A of, A., 433.  
   water content of, B., 284.  
   wood taint in, B., 481.  
   fat, effect of maize oil on production of, A., 1155.  
     effect of treatment with hydrochloric acid on constants of, B., 686.  
     vitamin-A of, A., 200.  
     in cheese, B., 445.  
     Rumanian, B., 1125.  
     determination in, of iodine, B., 899.  
   Irish, iodine and thiocyanogen values of, B., 1102.  
   Irish "bog," analyses of, B., 655.  
   shea, hydrocarbon from unsaponifiable matter of, A., 750.  
   tallowy and rancid, appearance of, in filtered ultra-violet light, B., 748.  
   unsalted, keeping qualities of, B., 1102.  
   effect of ageing on analytical constants of, B., 160.  
   detection in, of adulterants, B., 946.  
   of babassu fat and oleomargarine, B., 515.  
   determination of titratable acidity and  $p_H$  of, B., 78.  
   determination in, of fat, B., 284.  
   of vegetable oils, B., 686.

Butterflies, cestrin in, A., 433.  
 Buttermilk, dried, growth-promoting value of, A., 962.  
 determination in, of fat and effect of lecithin thereon, B., 784.  
 Buttons, manufacture of, from ivory-nut waste, (P.), B., 742.  
 Butyl alcohol, manufacture of, (P.), B., 44.  
 biologically, A., 1066.  
 from ethyl alcohol, (P.), B., 459.  
 by fermentation, (P.), B., 525, 573.  
 velocity of sound in, in *n*-heptane, A., 683.  
 equilibrium of, with acetone and water, A., 687.  
 determination of, in small quantities, A., 250.  
 in mixtures with ethyl alcohol, B., 55.  
 Butyl alcohol, trichloro-, magnetic susceptibility of, A., 1083.  
 isoButyl alcohol, action of radium rays on, A., 1007.  
 equilibrium of, with water, A., 801.  
 tert.-Butyl alcohol, *aaa*-trichloro-, preparation of, A., 1232.  
*n*- and iso-Butyl alcohols, equilibria of water and, and boiling point relations of those systems, B., 300.  
 Butyl arsenite, A., 937.  
 bromomethyl ether, A., 250.  
 $\alpha$ -chloroethyl ether, A., 41.  
*o*-phenylene phosphite, A., 379.  
 thiocarbimidoacetyl sulphide, A., 60.  
 isoButyl *N*-diphenyl- and *N*-*p*-nitrophenylurethanes, A., 1239.  
 tert.-Butyl  $\beta$ -ethoxyethyl ether, A., 719.  
 thionitrate, A., 929.  
 thionitrite, thermal dissociation of, and disulphide, A., 599.  
 tert.-Butylacetamide, Hofmann rearrangement of, A., 1023.  
 4-sec.-Butyl-4-allyl-3-5-diketopyrazolidine, A., 1143.  
*n*-Butylamine, action of nitrous acid on, A., 1022.  
*n*-Butylamine,  $\gamma$ -hydroxy-, and its derivatives, A., 287.  
 5-Butylaminobarbituric acid, 5-bromo-, A., 283.  
 1-isoButylaminobenzthiazole-5-carboxylic acid, derivatives of, A., 1267.  
 4-Butylaminophenylarsinic acids, 3-amino- and 3-nitro-, A., 1049.  
 Butylamylacetylene, A., 142.  
*dl*-sec.-Butylaniline, 2:4:6-trinitro-, and its resolution, A., 399.  
 Butylbenzene, 2:5-dihydroxy-, A., 648.  
 sec.-Butylbenzene, amino- and nitro-derivatives, A., 504.  
 Butyl-1:4-benzoquinone, A., 648.  
 isoButylcarbinols, configurative relationships of, A., 142.  
 Butylcellulose, B., 717.  
 Butylchloral, condensation of, with cresotic and gallic acids, A., 848.  
 hydrate, condensation of, with arylhydrazines, A., 283.  
 trans- $\alpha$ -*n*-Butylcinnamic acid, and its dibromide, A., 268.  
 tert.-Butylcymenes, and dinitro-, A., 729.  
*n*-Butyl-*n*-docosic acid, A., 720.  
*n*-Butyl-*n*-eicosylmalonic acid, and its ethyl ester, A., 720.  
 Butylene, calorimetric determination of, in gas mixtures, B., 247.  
 ozonide, dimeric, synthetic, A., 1114.  
 isoButylene. See *Δ*-Butylene.  
*d*- $\Delta$ -Butylene oxide, *l*-bromohydrin from, A., 143.  
 $\Delta\beta$ -Butylene,  $\beta\delta$ -dichloro-, A., 1231.

*Δ*-Butylene, absorption of, in strong acids, (P.), B., 221.  
 oxides, *mono*- and *tri*-chloro-, A., 383.  
 Butylenes, formation of, by pyrolysis of chlorobutanes, A., 1016.  
 formation of liquid hydrocarbons from, A., 250.  
 Butylenes, hexabromo-, crystal structure of, A., 451.  
 $\alpha\beta$ -*Δ*-Butylenediamine dihydrochloride, A., 256.  
 $\alpha\gamma$ -Butylene glycol, production of, from aldol, (P.), B., 95.  
 Butylguanidine salts, A., 605.  
 Butylharmol, pharmacology of, A., 647.  
 Butylidenebisdi-*indones*, A., 1252.  
 Butylidenebisdimethylidihydroresorcinol, A., 1235.  
 $\beta$ -Butylidenebisthiolacetic acid, A., 1235.  
 isoButylidene-*p*-bromoaniline dibromide, A., 742.  
 tert.-Butylmercaptan, and its salts and derivatives, A., 1017.  
 Butyl-3-nitrophthalimide, A., 1231.  
 $\delta$ -Butyloctan- $\gamma$ -one, A., 368.  
 2-isoButylphenmorpholine, A., 1145.  
*o*-sec.-Butylphenol, A., 504.  
*p*-tert.-Butylphenol, nitration of, A., 378.  
*p*-Butylphenol-2-sulphonic acid, salts of, A., 943.  
 2-*n*-Butylpiperidine hydrochloride, A., 1145.  
 2-sec.-Butylquinoline, and its picrate, A., 65.  
 $\beta$ -Butylstyrene,  $\beta$ -bromo-, A., 269.  
 $\alpha$ -*n*-Butylstyryl methyl ketone, and its oxime, A., 268.  
 tert.-Butylsulphonic acid, salts of, A., 1017.  
 tert.-Butylsulphonic acid, and its salts and derivatives, A., 1017.  
 6-Butyl-*p*-toluic acid, 3-hydroxy- $\alpha\beta\gamma$ -tetrachloro-, A., 849.  
 2-isoButyl-1:3:5-triazine, 4:6-diamino-, and its salts and acetyl derivatives, A., 756.  
*l*-*n*-Butylvinylcarbinol, reduction of, to *d*-ethyl-*n*-butylcarbinol, A., 362.  
 Butylxanthic acid, dimethyleneammonium salt, A., 48.  
 Butyric acid, and its ethyl ester, magneto-optical dispersion of, A., 323.  
 specific heat of aqueous solutions of, A., 1091.  
 in sweet wines, B., 364.  
 acid potassium salt, A., 1018.  
*p*-chlorophenacyl ester, A., 744.  
 $\alpha$ -naphthyl ester, A., 1251.  
 spinasteryl ester, A., 381.  
 determination of, in silage, B., 1129.  
 Butyric acid,  $\alpha$ -amino- $\beta\gamma$ -dihydroxy-, synthesis of, and its copper salt, A., 936.  
 $\alpha\beta$ -dibromo-, condensation of, with benzene, A., 382.  
 $\gamma$ -bromo- $\alpha\beta$ -dihydroxy-, synthesis of, A., 498.  
 $\alpha$ -hydroxy-, determination of, in presence of lactic and glycolic acids, A., 720.  
 $\beta$ -hydroxy-, formation of, by yeast, A., 305, 306.  
*n*- and iso-Butyric acids, extraction of, from aqueous solution by light petroleum, A., 331.  
 Butyrospermum Parkii, seed fat of, B., 354.  
 Butyrylcholine, hydrolysis of, A., 967.  
 1-isoButyrylcyclohexane-1-acetic acid, and its semicarbazone, A., 738.  
*dl*-Butyryl-*dl*-leucine,  $\alpha$ -amino-, and its *p*-nitrobenzoyl derivative, A., 957.  
 isoButyrylcyclopentane-1-acetic acid, and its derivatives, A., 738.  
 Butyrylphthalimides, A., 849.  
 Bystropogon mollis, constituents of, B., 863.  
 Bytarus tomentosus. See Beetles, raspberry.

## C.

Cabannes-Daure effect, A., 792.  
 Cabbage, red, dye of, A., 203.  
 Cables, compositions for coating of, (P.), B., 1041.  
 electric, drying and impregnation of, (P.), B., 559.  
 lead-antimony alloys for sheaths of, (P.), B., 231.  
 rubber for, B., 563.  
 with ribbed rubber coverings, (P.), B., 192.  
 high-tension, oil for, (P.), B., 220.  
 lead-sheathed, (P.), B., 268.  
 submarine, insulating materials for, (P.), B., 646, 945.  
 K-gutta as insulation for, B., 155.  
 Cacao, extraction of fat from, (P.), B., 116.  
 green manuring of, B., 278.  
 beans, catechin of, A., 975.  
 butter, B., 269, 312.  
 recovery of, (P.), B., 233.  
 melting and solidification of, B., 1125.  
 extraction and determination of vanillin in, B., 239.  
 products, determination in, of lactose, B., 1052.  
 determination of husks in, B., 46.  
 Cachexia, cure of, by growth hormones, A., 655.  
 in children, glycæmia in, A., 1156.  
 Cacodylic acid, sodium salt,  $p_H$  of solutions of sodium glycerophosphate, strychnine sulphate, and, B., 79.  
 Cactus, jointed, eradication of, B., 955.  
 Cadavers, skin of, A., 870.  
 Cadaverine, detection of, A., 1150.  
 Cadmium atoms, mean life of, A., 439.  
 recovery of, from its oxide, (P.), B., 513.  
 spectrum of, under high-frequency excitation, A., 2.  
 anomalous dispersion in, A., 668.  
 arc spectrum of, A., 551.  
 resonance spectrum of, A., 315.  
 absorption of resonanceradiation of, A., 2.  
 fluorescence of, A., 891.  
 electrodeposition of, from solutions of the sulphate, B., 846.  
 electroplating with, B., 986.  
 bath for, (P.), B., 473, 847, 942.  
 effect of, on resistance to fatigue tests, B., 511.  
 finishing of articles plated with, (P.), B., 473.  
 prevention of discoloration of electrodeposits of, B., 986.  
 crystals, electrical and thermal conductivity of, A., 905.  
 equilibrium of, with cadmium chloride, lead, and lead chloride, A., 1205.  
 electrodeposited, chemical colouring of, B., 109.  
 diffusion of, B., 150.  
 poisoning by. See under Poisoning.  
 Cadmium alloys with aluminium, A., 685.  
 with antimony, crystal structure of, A., 686.  
 with copper, A., 330.  
 with copper and zinc, electrodeposition of, from cyanide baths, B., 430.  
 with gold, A., 986.  
 with mercury, superconductivity of, A., 686.  
 heats of solution, heats of formation, and free energies of formation of, A., 126.  
 use of, in volumetric analysis, A., 712.  
 solid, A., 989.

Cadmium alloys with silver, electrolytic, A., 989.  
 with strontium, B., 187.  
 with tin, A., 330.  
 with zinc, electrodeposition of, from cyanide baths, B., 987.  
 electroplating with, (P.), B., 1088.  
 Cadmium salts, complex, activation of, A., 578.  
 Cadmium bromide, equilibrium of, with potassium bromide and water, A., 574.  
 carbonate, hydrolysis of, A., 1205.  
 reaction of, with hydrogen and with sulphur, A., 1094.  
 chloride, crystallisation of ammonium chloride with, A., 1198.  
 equilibrium of, with cadmium, lead, and lead chloride, A., 1205.  
 with potassium chloride and water, A., 469.  
 fluoberyllate, A., 583.  
 halides, electrolytic dissociation of, A., 343.  
 iodide, energy levels of molecules of, A., 680.  
 catalytic decomposition of hydrogen peroxide by, A., 346.  
 oxide, reactions of, A., 1003.  
 sulphate, effect of heat on ammonia compounds of, A., 696.  
 sulphide, photo-electric properties of, A., 446.  
 thermochemistry of, A., 812.  
 sulphochromite, spinel structure of, A., 114.  
 Cadmium detection and determination:—  
 detection of, in zinc oxide, spectroscopically, A., 826.  
 determination of, micro-electrolytically, A., 922.  
 determination in, of zinc and impurities, B., 845.  
 Cæsium, isotopic constitution and atomic weight of, A., 209.  
 isotopes of, A., 5.  
 nuclear moment of, A., 104, 210.  
 spark spectrum of, A., 439.  
 Stark effect for, A., 979.  
 radiation from, on electronic bombardment, A., 1184.  
 photo-electric absorption in vapour of, A., 316.  
 photo-electric effect of, adsorbed on salt layers, A., 441.  
 excitation of vapour of, in electric discharge, A., 1183.  
 films of, on tungsten, A., 459.  
 introduction of, into radio valves, (P.), B., 896.  
 Cæsium alloys, (P.), B., 990.  
 Cæsium chloride, vapour pressure of saturated aqueous solutions of, A., 339.  
 chloroplatinate, crystal structure of, A., 564.  
 fluoriodochloride, A., 823.  
 sulphate, heat of dilution of, A., 23.  
 dithionate, crystal structure of, A., 986.  
 Cæsium detection and determination:—  
 detection of, A., 922.  
 determination of, in presence of alkali metals, A., 1010.  
 Cæsium biotite, from S. Dakota, A., 1228.  
 Caffeic acid, free and combined, in coffee, B., 46.  
 Caffeine, adsorption of, by earths, A., 689.  
 in cereal beverages, B., 959.  
 existence and distribution of, in guarana, A., 204.

Caffeine, effect of, on colloidal osmotic pressure of blood in nephrectomy, A., 540.  
 on solubility of uric acid and sodium urate, A., 425.  
 detection of, A., 1150.  
 determination of, B., 1054.  
 chloroform extraction apparatus for, B., 817.  
 iodometrically, A., 411.  
 in presence of amidopyrin and phenacetin, B., 448.  
 in coffee and coffee extracts, B., 205, 1103.  
 in maté, coffee, tea, kola nut, and guarana, B., 367.  
 Caiman fat, B., 559.  
 Calabar beans, determination of alkaloids in, B., 863.  
 Calamary oil, unsaponifiable matter of, B., 116.  
 Calaverite, A., 248.  
 Calciferol, and its nitrobenzoates, A., 311.  
 effect on dogs of, A., 1176.  
 Calcination, apparatus for, (P.), B., 163.  
 Calcite, grating constant of, A., 217.  
 parameter of, A., 564.  
 absorption and reflexion infra-red spectra of, A., 212.  
 dispersion of X-rays in, A., 113.  
 inner potential of, A., 209.  
 pseudo-absorption in, A., 493.  
 X-ray analysis of, A., 1184.  
 Calcium, purification of, (P.), B., 513.  
 absorption spectrum of, A., 668.  
 equilibrium of, with sulphur and oxygen, A., 574.  
 Calcium compounds in diet, A., 642.  
 Calcium salts, A., 874.  
 effect of buffers on ionisation of, in physiological salt solutions, A., 648.  
 physiological action of, A., 192, 302, 426.  
 therapeutic effect of, A., 648.  
 effect of, on mineral exchanges in man, A., 962.  
 local irritation produced by, A., 964.  
 absorption of, in the organism, A., 89.  
 retention of, in the organism, A., 300.  
 in the organism in relation to inflammation, A., 81.  
 effect of vitamin-D on conservation of, in the organism, A., 974.  
 distribution of, in blood, A., 1272.  
 in blood, effect of fluorides and oxalates on, A., 426.  
 stability of, in blood and saliva, A., 533.  
 and calcæmia in man, A., 413.  
 Calcium aluminate, hydration of, B., 147.  
 aluminates, A., 583, 822.  
 hydrothermal synthesis of, A., 707, 1007, 1217.  
 crystallisation of, A., 1217.  
 chromo-, selenio-, and sulpho-aluminates, A., 131.  
 sulphoaluminate, resistance of, to sea water, B., 549.  
 azide hydrazinates, A., 351.  
 metaborate, crystal structure of, A., 114.  
 boride, manufacture of, (P.), B., 981.  
 bromide as a drying agent at low temperature, A., 317.  
 carbide, production of, from calcium phosphate, (P.), B., 145.  
 azotation of, A., 817, 1003, 1095, 1213.  
 decomposition of, B., 1118.  
 shaped, manufacture of, (P.), B., 505.  
 analysis of, B., 463.  
 determination of, in calcium cyanamide, B., 420.

Calcium carbonate, Raman spectrum of, A., 1189.  
 thermal dissociation equilibrium of, A., 124, 810.  
 solubility of, in carbon dioxide-free water, A., 457.  
 in sea-water, A., 38.  
 separation of carbon from, (P.), B., 145.  
 peptisation of, by sucrose or mannitol, A., 19.  
 rate of decomposition of, A., 817.  
 reaction of, with silica, A., 817.  
 in shells and skeletons of recent and fossil organisms, A., 927.  
 See also Iceland spar.  
 carbonate and sulphate, solubility of, A., 990.  
 hydrogen carbonate, thermal decomposition of, A., 477.  
 decomposition of boiling solutions of, A., 703.  
 and its mixtures with magnesium hydrogen carbonate, decomposition of, by heat, A., 234.  
 chlorate, production of, by chlorination of milk of lime, B., 101.  
 equilibrium of, with water, A., 810.  
 chloride, production of, (P.), B., 305.  
 from ammoniacal liquors, (P.), B., 1028.  
 separation of, from magnesium chloride, (P.), B., 1078.  
 heat absorption in cooling of solutions of, A., 914.  
 density and partial molal volume of ammonia in amines of, A., 113.  
 equilibrium of, in solutions with carbamide, A., 1091.  
 with magnesium chloride and water, A., 1091.  
 manufacture of dehydrating material from, (P.), B., 421.  
 anhydrous, manufacture of, (P.), B., 102.  
 chromate, and its hydrates, structure of, A., 1079.  
 fluoberyllate, A., 583.  
 fluoride, effect of, on azotation of calcium carbide, A., 1213.  
 refining of glass with, B., 936.  
 hydride, band spectrum of, A., 551.  
 Zeeman effect in, A., 315.  
 hydroxide, pure, preparation of, (P.), B., 251.  
 electrical conductivity of aqueous solutions of, A., 998.  
 dissociation pressure of, A., 1204.  
 solubility of, in aqueous salt solutions, A., 117.  
 crystalline, preparation of, A., 238.  
 equilibria of, with phosphoric acid, carbon dioxide, and water, A., 229.  
 hypochlorite, manufacture of, (P.), B., 935.  
 from its solution, (P.), B., 505.  
 stability of, B., 100.  
 determination in, of insoluble matter, B., 770.  
 iodate, equilibrium of, with sodium iodate and water, A., 341.  
 nitrate, manufacture of, (P.), B., 981.  
 from dolomite, with recovery of magnesium, (P.), B., 934.  
 neutral, anhydrous, (P.), B., 599.  
 heats of hydration and solution of aqueous solutions of, A., 698.  
 nitrate and sulphate, heats of dilution of, A., 23.  
 nitride, synthesis of, A., 238.

Calcium oxide, (*lime*), production of, (P.), B., 25, 599.  
 for building materials, (P.), B., 642.  
 from dolomite, (P.), B., 505.  
 kilns for, (P.), B., 106, 345, 773.  
 silico-aluminous materials for, B., 888.  
 rotary kilns for burning of, (P.), B., 106.  
 slaking machines for, (P.), B., 26.  
 rate of absorption of moisture by, A., 128.  
 cathodic phosphorescence of rare earths in, A., 321.  
 solution and hydration of, in presence of calcium sulphate, B., 304.  
 equilibrium of, with aluminium and sodium oxides, A., 574.  
 with carbon, A., 341.  
 with carbon dioxide and sulphur dioxide, A., 1090.  
 with phosphorus pentoxide, A., 1204.  
 with sucrose and water, A., 341.  
 reactions of, with sulphur and sulphur dioxide, A., 913.  
 compounds of, with phosphoric acid, A., 469.  
 fertiliser, titration of basic constituents of, B., 952.  
 shaped, manufacture of, (P.), B., 260.  
 slaked, production of, (P.), B., 44.  
 technical analysis of, B., 504.  
 determination of, in presence of magnesia, A., 922.  
 in cement, B., 344, 468, 549, 727.  
 oxide and hydroxide, determination of, in building materials, B., 344.  
 peroxide, thermal dissociation of, A., 573.  
 phosphate, production of, (P.), B., 421.  
 treatment of, (P.), B., 547.  
 absorption of sulphur dioxide by, B., 677.  
 solubilisation of, for fertilisers, B., 259.  
 solvent action of gastric juice on, A., 416.  
 solidification of reaction products of nitric acid and, (P.), B., 1028.  
 in milk, A., 78.  
 slightly soluble, formation of, from aqueous solution, A., 707.  
 phosphate and hydrogen phosphate, determination in, of citrate-soluble phosphoric acid, B., 259.  
 monohydrogen phosphate, production of, (P.), B., 261, 506.  
 action of water on, A., 707.  
 dihydrogen phosphate, stabilisation of, in solution, and preparation of alkaline phosphates therefrom, (P.), B., 421.  
 reaction between the sulphate and, B., 420.  
 reaction between ferric sulphate and, B., 545.  
 phosphates, A., 1217.  
 thermochemistry of, A., 812.  
 decomposition of, (P.), B., 421.  
 action of sulphur dioxide on, A., 30.  
 precipitated, preparation and composition of, B., 1118.  
 metaphosphates, influence of steam on solubility of, B., 101.  
 silicate, mixed crystals of manganese silicate and, A., 1197.  
 decomposition of, at 1000-1300°, A., 131.  
 silicates, synthesis of, A., 350, 481, 574; B., 262.  
 hydrothermal synthesis of, A., 131, 583, 707, 822, 1008, 1216; B., 25.  
 metasilicates, thermochemistry of, A., 1092.

$\beta$ -Calcium metasilicate. See Wollastonite.  
 Calcium silicophosphates, A., 1217.  
 sulphate, molecular transformations of, A., 1216.  
 solubility of, in presence of sodium chloride, A., 990.  
 anhydrous, preparation of, (P.), B., 261.  
 hemihydrate, dehydration of, A., 706.  
 equilibrium of, with nickel sulphate and water, A., 913.  
 reaction of sodium carbonate and, at boiler temperatures, B., 1077.  
 determination of, in bone charcoal, B., 1015.  
 sulphide, phosphorescence of, A., 1216.  
 sulphite, pyrogenic decomposition of, A., 919.  
 hydrogen sulphite, production of solutions of, (P.), B., 678.  
 magnesium hydrogen sulphite, production of, from magnesian rock, (P.), B., 724.  
 tungstate, luminosity from electron collision with, A., 980.  
 Calcium organic compounds:—  
 Calcium cyanamide, A., 469.  
 manufacture of, (P.), B., 934.  
 and its mixtures with superphosphate, B., 694.  
 effect of storage on, B., 545.  
 determination in, of calcium carbide, B., 420.  
 of total nitrogen, B., 545.  
 phosphates, organic, (P.), B., 817.  
 saccharates, A., 229.  
 Calcium detection and determination:—  
 detection of, colorimetrically, in presence of strontium, A., 355.  
 reagent for, A., 1223.  
 by potassium ferrocyanide, A., 1223.  
 determination of, by filtration, A., 1010.  
 microchemically, A., 35.  
 and its separation from magnesium, A., 588.  
 in blood, A., 531.  
 in blood and serum, A., 293.  
 in blood-serum, A., 75.  
 separation of, from aluminium, A., 1223.  
 Calcium minerals kept in wooden cases, formation of acetate on, A., 39.  
 Calculi, X-ray diffraction of, A., 296.  
*Calendula officinalis*. See Marigold.  
 Calf-skin, structure of, as indicated by molybdenum radiation, B., 273.  
*Caliche*, treatment of, (P.), B., 464.  
 Callicrein, A., 547, 972.  
 hypoglycæmic action of, A., 1172.  
*Calophyllum inophyllum*, oil from nuts of, B., 849.  
 Calorimeters, adiabatic, thermo-regulators for, A., 245.  
 automatic micro-compensation, A., 827.  
 bomb, B., 375.  
 electrical, A., 1224.  
 Junker, portable, B., 819.  
 Lewis-Thomson modified, A., 1104.  
 micro-, isothermic titration, A., 1104.  
 twin, A., 812.  
 vacuum high-temperature, A., 713.  
 Calorimetry, A., 23, 342.  
 errors in, A., 688.  
 adiabatic, temperature control closet for, A., 713.  
 animal, A., 191, 1058.  
 clinical, A., 83, 418.  
 Calorising, B., 645.  
 Calumba root, alkaloids of, A., 177.  
 Calves, substitution of pichard oil for butter fat in milk for feeding of, B., 283.  
 sugar beet pulp as feeding stuff for, B., 445.

Calves, dairy, vitamin-D in nutrition of, A., 1176.  
 suckling, feeding of carbohydrates to, A., 421.  
 Camellia oil, solubility of, in aqueous acetone, B., 29.  
*Camelus bactriens*, blood of. See under Blood, camel's.  
 Cameras, synthetic resins for parts of, (P.), B., 914.  
 for back-reflecting Laue interference figures, A., 796.  
 Laue improved, A., 1105.  
*apocamphane*, preparation of, A., 857.  
 Camphanodihydroquinoxaline, amino-, and its derivatives, A., 166.  
 Camphene, manufacture of, (P.), B., 13, 494, 764, 974.  
 racemisation of, A., 398, 517.  
 reaction of, with oxalic acid, A., 1037.  
 Camphenilene. See *apoiso*Fenchene.  
 Camphenilone hydrazone, acetyl derivative, A., 857.  
 Camphocenaldehydic acid, derivatives of, A., 1037.  
 $\beta$ -Campholide- $\beta$ -acetic acid, ethyl ester, A., 1037.  
 Camphor, A., 62.  
 formation of, catalytically, from borneol, A., 165.  
 synthesis of, A., 1253.  
 and its derivatives, rotation dispersion of, A., 323, 794.  
 isomerisation of linalool into, A., 165.  
 metabolic action of, cutaneously applied, A., 191.  
 Japanese, action of, on the heart, A., 948.  
 determination of, in camphor liniments prepared with oils other than cottonseed, B., 160.  
 in spirit of camphor, B., 240.  
 in liniments, B., 656.  
 Camphor, *p*-hydroxy-, manufacture of, (P.), B., 960.  
*pernitroso*-, condensation of, with primary amines, A., 517.  
*d*-Camphor, dipole moment of, A., 677.  
 2,4-dinitrophenylhydrazones, A., 276.  
*l*-Camphor, formation of, from *d*-camphor, and 4-chloro-, and its semicarbazone, A., 62.  
 Camphors, oximino-, configuration of, A., 276.  
 Camphor oil, determination of cineole in, B., 161.  
 Camphoranil, A., 517.  
 Camphoranilic acid, 2':4'-dichloro-, A., 1253.  
 Camphoranilic acids, substituted, and their rotatory power, A., 1253.  
 Camphorated oil, medicinal, physical constants of, B., 862.  
 Camphorazine, A., 517.  
 Camphor-*p*-bromoanil, A., 517.  
 Camphorcarboxylic acid, cholesteryl ester, and its derivatives, A., 381.  
 Camphorcarboxylic acid, bromo-, decomposition of, in presence of quinine, A., 966.  
 Camphoric acid, *ortho*-methyl hydrogen ester, conversion of, into *allo*-methyl hydrogen ester, A., 399.  
 carboxy-derivatives, rearrangement of, A., 399.  
 higher  $\beta$ -homologues of, A., 1037.  
*cis-trans*-Camphoric acid dinitriles, A., 399.  
*cis*-Camphor-*tert*-nitrile acid, amide of, and its rearrangement, A., 399.  
 Camphor- $\psi$ -nitrole, A., 271.  
 Camphorquinone, optical rotation of, A., 323.

- Camphor- $\beta$ -sulphonic acid, rotatory dispersion of, A., 1254.
- 2-d-Camphorsulphonylquinol. See Quinol-d-camphorsulphone.
- Canadine from *Hydrastis canadensis*, configuration of, A., 178.
- Cancer, diagnosis of, A., 418.
- substances producing, A., 536, 767.
- production of, by pure hydrocarbons, A., 1156.
- metabolism of cells in, A., 417.
- effect of lubricating oils on, A., 1277.
- influence of mineral content of drinking water and soils on frequency of, in man, A., 1056.
- calcium content of tissues in, A., 1277.
- cholesterol in blood in, A., 872.
- cholesterol content of lipins in, A., 641.
- cholesterol and phosphorus compounds during growth of, A., 1277.
- diastase in urine in, A., 418.
- enzyme action in biochemistry of, A., 1278.
- blood glycolysis in, A., 1278.
- hyperglycaemia in, A., 872.
- sex hormones in tissues in, A., 960.
- influence of magnesium on mortality in, A., 960.
- potassium content of bone marrow in, A., 186.
- mouse, effect of radioactivity on, A., 296.
- effect of varying diet on, A., 1277.
- non-pigmented navo-, tyrosine, and other amino-acids in, A., 767.
- determination of nitrogen in, A., 418.
- Cancerite from Vischny Gory, Ural, A., 249.
- Candles, manufacture of, (P.), B., 831.
- determination in, of beeswax, B., 1090.
- Candy, yeast, vitamins in, B., 857.
- Cannabinol, constitution of, A., 382.
- and dinitro-, and their derivatives, A., 748.
- Cannabinolactone, synthesis of, A., 382.
- Cannabis indica*, and its derivatives, detection of, B., 817.
- Beam's reaction for, B., 1136.
- resin from, A., 747.
- Canning, pressure developed in cans during, B., 367.
- use of lacquers in, B., 239.
- Cantharidin, determination of, in *Lytta adspersa*, B., 47.
- Cantharis oil, fatty acids from, A., 184.
- Caoutchouc, A., 249, 619; B., 315.
- elasticity of, A., 1089.
- dipole moment of, A., 677.
- gels, structure of, A., 1088.
- oxidation of, with hydrogen peroxide, A., 398.
- reaction of, with thioglycollic acid, A., 1139.
- mineral products resembling, A., 707.
- natural and artificial, thermal decomposition of, A., 1036.
- See also Rubber.
- Capillaries, crowding effect in current flow through, A., 699.
- Capillarity, A., 112, 691, 993.
- between parallel plates, A., 909.
- in aqueous solutions, A., 333.
- quasi-laminar, flow in, A., 119.
- See also Electrocappilarity.
- Capillary activity, determination of, A., 803.
- flow. See under Flow.
- Caramel, manufacture of paste of, B., 1100.
- Carbamic acid, sodium salt, production of, from sodium chloride, B., 1027.
- Carbamic acid, esters, manufacture of, (P.), B., 1071.
- compositions of cellulose acetate and, (P.), B., 881.
- disubstituted, manufacture of, (P.), B., 241.
- methyl-2-diphenyl ester, A., 1041.
- Carbamic acid, dithio-, salts, manufacture of, (P.), B., 21.
- complex salts, magnetic susceptibility of, A., 10.
- salts and esters of, A., 150.
- benzylammonium salt, and its derivatives, A., 150.
- manganic salts, A., 133.
- S-acetyl, S-acetonyl, S-carbethoxy-acetonyl, S-phenacyl, N-piperidyl-S-acetyl and S-propionyl esters, A., 68.
- Carbamide (urea), synthesis of, by ammoniacal oxidation of carbon compounds, A., 727.
- single-crystal spectrometric data on, A., 218.
- solubility of, in water, A., 687.
- equilibrium of, with ammonia and carbon dioxide, A., 23.
- in solutions with calcium chloride, A., 1091.
- with hydrogen peroxide and water, A., 811.
- condensation of, with bromal, A., 1114.
- with chloral, A., 151.
- with formaldehyde, A., 150.
- and its derivatives, condensation products of formaldehyde and, (P.), B., 118, 998.
- condensation products of, with thio-carbamide and formaldehyde, (P.), B., 807.
- compounds of, with acids and phenols, A., 936.
- with alkaline-earth bromides, A., 997.
- with metallic nitrates, A., 125.
- manufacture of derivatives of, (P.), B., 577.
- phosphate, A., 913; B., 636.
- See also Urea.
- $\psi$ -Carbamide, aryl ethers of, A., 610.
- Carbamides, magnetic susceptibility and density of, A., 1191.
- isoCarbamides, magnetic susceptibility and density of, A., 1191.
- $\alpha$ -Carbamido- $\alpha$ -benzylbutyronitrile, A., 862.
- $\alpha$ -Carbamido- $\alpha$ -benzylpropionitrile, A., 862.
- 1-Carbamido-1-cyanocyclohexane, A., 862.
- 7-Carbamidofluorenone-2-arsinic acid, and its sodium salt, A., 761.
- Carbamidomethionie acid, dipotassium salt, A., 1118.
- $\alpha$ -Carbamido- $\gamma$ -phenyl- $\alpha$ -ethylbutyronitrile, A., 862.
- $\alpha$ -Carbamido- $\gamma$ -phenyl- $\alpha$ -methylbutyronitrile, A., 862.
- Carbamyl chloride, *p*-nitro-, A., 597.
- Carbamylagmatine, and its salts, A., 94.
- Carbamylcholine chloride, toxicity and pharmacology of, A., 301.
- action of, in the organism, A., 1061.
- Carbamylputrescine, and its salts, A., 545.
- Carbazole, purification of, (P.), B., 497.
- berginisation of, B., 832.
- nitration of, A., 168.
- Carbazole, 1:3:6:8-tetranitro-, derivatives of, A., 267.
- Carbazole-2:7-disulphonic acid, manufacture of, (P.), B., 138.
- Carbazoledisulphonic acid, 3-amino-, and 3-nitro-, calcium salt, A., 176.
- Carbazole-7-sulphonic acid, 2-hydroxy-, manufacture of, (P.), B., 793.
- p*-Carbethoxybenzamidine hydrochloride, A., 55.
- p*-Carbethoxybenziminioether hydrochloride, A., 55.
- (5-Carbethoxy-2-bromomethyl-3-pyrryl-methyl)malonic acid, 4-bromo-, ethyl ester, A., 281.
- $\beta$ -(5-Carbethoxy-2-bromomethyl-3-pyrryl-propionic acid,  $\beta$ -4-bromo-, A., 281.
- 3-Carbethoxy-1-(2':4':6'-tribromophenyl)-pyrazole, 5-bromo-4-hydroxy-, and 4-hydroxy-, and its benzoyl derivative, A., 377.
- $\gamma$ -Carbethoxybutyryl chloride, A., 291.
- 3-Carbethoxy-1-carbamyl-4-cyanopyrazolone, A., 602.
- 3-Carbethoxy-1-(2':4':6'-trichlorophenyl)-pyrazole, 5-bromo- and 5-chloro-4-hydroxy- and 4-hydroxy-, and their derivatives, A., 377.
- $\beta$ -Carbethoxy- $\alpha\alpha'$ -diketoadipic acid, ethyl ester, A., 1234.
- 4-Carbethoxy-3:3'-dimethyl-4'-ethyl-5- $\beta$ -carboxyethylpyrromethene hydrobromide, and its bromo-derivative, A., 861.
- 1-Carbethoxy-3:3'-dimethylindoline, 2-chloro- and 2-hydroxy-, A., 1260.
- 5-Carbethoxy-2:4-dimethyl-3-pyrrylacetaldoxime, A., 861.
- 5-Carbethoxy-2:4-dimethyl-3-pyrrylacetone, A., 861.
- 5-Carbethoxy-2:4-dimethyl-3-pyrrylmaleic acid, A., 626.
- (5-Carbethoxy-2:4-dimethyl-3-pyrryl)-methylbarbituric acid, A., 627.
- 5-Carbethoxy-2:4-dimethyl-3-pyrrylsuccinic acid, and its derivatives, A., 626.
- $\alpha$ -Carbethoxyglutaconic acids, esters of, A., 601.
- Carbethoxyglyoxal, 2:4:5-trichloro-, phenylhydrazone and -osazone, A., 625.
- 2-Carbethoxy- $\Delta^1$ -cyclohexenylcyanoacetic acid, ethyl ester, A., 1128.
- 2-Carbethoxy- $\Delta^1$ -cyclohexenylpropionic acid, and its derivatives, and  $\alpha$ -cyano-, ethyl ester, A., 1128.
- 5-Carbethoxy-4-methyl-3- $\beta$ -carboxyethyl-2-pyrrylacetic acid, A., 861.
- $\beta$ -(5-Carbethoxy-4-methyl-3- $\beta$ -carboxyethyl-2-pyrryl)acrylic acid, A., 282.
- 5-Carbethoxy-2-methyl-4-ethyl-3-( $\beta\beta$ -dicarbethoxy)ethylpyrrole, and its 2-bromo-methyl derivative, A., 864.
- 5-Carbethoxy-4-methyl-2-ethyl-3-pyrryl-methylmalonic acid, esters of, A., 174.
- 3-Carbethoxy-4-methyl-2-furyloximinooacetic acid, derivatives of, A., 166.
- $\alpha$ -Carbethoxy- $\gamma$ -methylglutaric acid, ethyl ester, A., 602.
- Carbethoxymethyl-3-nitrophthalimide, A., 1231.
- $\beta$ -(5-Carbethoxy-2-methyl-3-pyrryl)acrylic acid, A., 281.
- (5-Carbethoxy-2-methyl-3-pyrrylmethyl)-malonic acid, and its derivatives, A., 281.
- $\beta$ -(5-Carbethoxy-2-methyl-3-pyrryl)propionic acid, and its derivatives, A., 281.
- 3-Carbethoxy-*lin*-naphthindazole-4:9-quinone, and its derivatives, A., 170.
- 3-Carbethoxy-1-naphthyl methyl ketoximes, 2-hydroxy-, and their derivatives, A., 743.
- 5-Carbethoxy-3:4:3':4':5'-pentamethylpyrromethene hydrobromide, A., 173.
- 2-Carbethoxy- $\Delta^1$ -cyclopentenylacetic acid, and its derivatives, A., 1127.
- 2-Carbethoxy- $\Delta^1$ -cyclopentenylcyanoacetic acid, ethyl ester, A., 1127.
- 2-Carbethoxy- $\Delta^1$ -cyclopentenylmalonic acid, ethyl ester, A., 1127.

2-Carboethoxy- $\Delta^1$ -cyclopentenylpropionic acid, and  $\alpha$ -cyano-, and their derivatives, A., 1127.

$\alpha$ -p-Carboethoxyphenyl- $\gamma$ -alkylthiocarbamides, action of bromine on, A., 1267.

$\alpha$ -p-Carboethoxyphenyl- $\gamma$ -isobutylthiocarbamide, A., 1267.

$\alpha$ -p-Carboethoxyphenyl- $\gamma$ -ethylthiocarbamide, A., 1267.

$\alpha$ -Carboethoxy- $\beta$ -phenylglutamic acid, ethyl ester,  $\alpha$ -sodium derivative, A., 1128.

p-Carboethoxyphenylguanidine, and its salts, A., 55.

$\alpha$ -p-Carboethoxyphenyl- $\gamma$ -methylthiocarbamide, A., 1267.

$\beta$ -Carboethoxy- $\beta$ -phenylpropionic acid, A., 1130.

3-Carboethoxypiperidinoacetic acid, derivatives of, A., 167.

3-Carboethoxypiperidinoacetone, A., 167.

$\gamma$ -3-Carboethoxypiperidinobutyric acid, derivatives of, A., 167.

$\beta$ -3-Carboethoxypiperidinopropionic acid, and its derivatives, A., 167.

5-Carboethoxy-4:3':5'-trimethyl-3:4'-diethyl-2:2'-pyrromethene hydrobromide, and its 5'-bromomethyl derivative, A., 864.

4-Carboethoxy-3:4':5'-trimethyl-3'-ethylpyrromethene, 5-bromo-, hydrobromide of, A., 174.

Carbides, formation of, from metals and methane, A., 238.

magnetism of, A., 10.

superconductivity of, A., 565.

Carbimides, manufacture of, (P.), B., 793.

Carbinols, acetylenic, reduction of, with titanium trichloride, A., 496.

tert.-aliphatic, synthesis of, A., 598.

aromatic, configurative relationships of, A., 1027.

secondary, containing neopentyl system, dehydration of, A., 1109.

tertiary, use of sodium in formation of, by condensations, A., 157.

containing neopentyl system, dehydration of, A., 1232.

"Carbo medicinalis," adsorption of acetate buffers by, A., 458.

Carbocyanines, tautomerism of, A., 756.

Carbocyanines, thio-, manufacture of, (P.), B., 1105.

Carbodi-imides, stereochemistry of, A., 840.

Carbohydrates, A., 42, 45, 147, 256, 718, 723, 1115.

constitution of, A., 602.

photosynthesis of, *in vitro*, A., 29, 237, 480.

in ultra-violet light from activated carbon dioxide solutions, A., 237.

optical rotatory dispersion in, A., 1020.

viscosity of, in liquid ammonia, formamide and water, A., 461.

benzoylation of, in presence of boric acid, A., 723.

oxidation of, A., 148, 369.

catalytic oxidation of, in presence of iron pyrophosphates, A., 476.

oxidation-reduction of, A., 472.

cryoscopic determinations of molecular weights of polymerides of, A., 725.

action of, with acetic acid, A., 722.

with hydrogen fluoride, A., 604.

with sulphuric acid, A., 1201.

with thiolacetic acid, A., 723.

and their compounds, precipitation of, (P.), B., 417.

production of soluble compound of calcium with, (P.), B., 207.

conjugated protein compounds of, A., 957.

Carbohydrates, production of organic acids by fermentation of, A., 968.

acetone-butyl alcohol fermentation of, (P.), B., 525.

in human nutrition, A., 538.

degradation of, in the liver, A., 188.

adsorbed on colloids as antigens, A., 884.

from hydrolysis of cellulose, purification of, (P.), B., 524.

highly polymerised, decomposition of, (P.), B., 524.

identification of, A., 1236.

detection of, in urine, A., 186.

*sym.*-Carbohydrazinodiphenylene-*pp*-distibinic acid, A., 867.

Carboligase, animal, A., 1287.

Carbolineum, crude and "soluble," analysis and standardisation of, B., 1112.

p-Carbo-*l*-menthoxydiphenylcarbodi-imide, A., 840.

p-Carbo-*l*-menthoxythiocarbaniide, A., 840.

$\gamma$ -Carbomethoxybutyryl chloride, A., 291.

(5-Carbomethoxy-2-methyl-3-pyrrylmethyl)-malonic acid, A., 281.

N-Carbomethoxypyrazoline-3:4:5-tricarboxylic acid, methyl ester, A., 863.

Carbon, atomic weight of, A., 566.

X-ray structure of, A., 1078.

analogies of, with germanium, A., 901.

atoms, affinity and heat effect of hydrogenation of double linking between, A., 341.

energy levels of, A., 551.

chains, synthesis of, A., 932.

rotation of, A., 987.

rings, A., 58, 253, 1134.

tetrahedral angle, effect of methylcyclohexane ring on, A., 741.

effect of methylcyclopentane ring on, A., 740.

preparation of, by thermal decomposition of benzene, A., 1099.

manufacture of, (P.), B., 248, 537, 667, 921.

from acetylene, (P.), B., 298.

from carbon monoxide, (P.), B., 22.

from hydrocarbons, (P.), B., 492.

and hydrogen, (P.), B., 1112.

purification of, for spectroscopy, A., 1218.

spectrum of, effect of crystal form on, A., 1184.

second spark spectrum of, A., 1.

dispersion of, (P.), B., 490.

dipole moment measurements in stereochemistry of, A., 506, 507.

electrical resistance of, A., 683.

ionisation potential of, A., 3.

heat of sublimation of, A., 684.

heat of wetting of, in mixtures of acetic anhydride and water, A., 804.

adsorptive power and graphite structure of, A., 803.

adsorptive capacity, catalytic activity and crystal structure of, A., 16.

adsorption and stabilisation of, in solutions of dyes, A., 804.

cataphoresis of colloidal solutions of, A., 695.

equilibria of, with alumina, lime, and silica, A., 341.

with iron, A., 15; B., 550.

with its oxides, A., 227, 577.

and its oxides, with iron and its oxides, A., 340, 574.

activation of, with carbon dioxide, A., 132.

velocity of combustion of, A., 816.

reaction of, with ferrous oxide, in steel, A., 1211.

use of, in pulp and paper industry, B., 673.

Carbon, manufacture of mouldable materials from, (P.), B., 1092.

active, A., 217.

manufacture of, (P.), B., 457, 490.

from carbon monoxide, (P.), B., 328.

from light ashes from furnaces, etc., (P.), B., 298.

by treatment of pitches and tars, (P.), B., 409.

specification for, B., 6.

vapour pressure and structure of, A., 331.

determination of absorptive power of, B., 396.

adsorption by, of acids, A., 118.

of electrolytes, A., 689.

of mercury vapour, A., 689.

hydrolytic adsorption by, A., 118.

crystal structure and catalytic activity of, A., 1212.

inflammation temperature of, A., 1211.

refining of sugar with, B., 1099.

decolorisation of sugar juice with, B., 1099.

treatment of water with, B., 1106.

granular, production of, (P.), B., 490.

powdered hydrafin, purification of water with, B., 578.

adsorbent, ash-free, production of, (P.), B., 8.

amorphous, adsorption of argon by, A., 991.

colloidal, from action of carbohydrates and sulphuric acid, A., 1201.

decolorising, manufacture of, (P.), B., 54, 1113.

drying of, (P.), B., 170.

revivification of, (P.), B., 170.

for wines, B., 620.

granular, production of, (P.), B., 761.

medicinal, evaluation of, B., 785.

Carbon compounds, bivalent, A., 143, 363.

heteropolar, A., 263.

trivalent, A., 611.

Carbon tetrabromide, use of, as brominating agent, A., 717.

tetrachloride, manufacture of, (P.), B., 540.

infra-red absorption spectra of, A., 1188.

scattering of X-rays by vapour of, A., 218.

scattering of X-rays and cathode rays by, A., 1078.

collision areas of molecules of, A., 566.

diamagnetism and structure of, A., 795.

variation of melting point and volume of, with thermal pre-treatment, A., 1194.

boiling points and specific gravities of mixtures of ethylene dichloride and, A., 243.

fluorination of, A., 142.

reaction of, with sulphur trioxide, A., 816.

poisoning. See under Poisoning.

tetrafluoride, physical properties of, A., 905.

tetraiodide, crystal structure of, A., 326.

monoxide, energy loss by medium-velocity electrons in, A., 106.

rectilinear diameter of, A., 680.

from carbonates, A., 707.

production of, from the dioxide, (P.), B., 886.

from hydrocarbons, (P.), B., 830.

from methane, B., 62, 326.

production of mixtures of hydrogen and, (P.), B., 62, 600, 982, 1066, 1067.

recovery of, from industrial gases using cuprous salt solutions, B., 180.



**Carbon monoxide**, infra-red absorption spectrum of, A., 792.  
 band spectrum of, A., 444.  
 production of ions in, by electron impact, A., 3, 321.  
 heat capacity and entropy of, A., 906.  
 heats of combustion and formation of, A., 1091.  
 density of, A., 566.  
 and its mixtures with hydrogen, isotherms of, A., 116.  
 b.p. of, A., 905.  
 vapour tension, critical point and triple point of, A., 454.  
 adsorption of, by copper, A., 1199.  
   on manganous oxide, A., 991.  
 equilibrium of carbon and its dioxide with, B., 133.  
 combustion of, catalytic action of water vapour in, A., 1212.  
 condensed discharge ignition of mixtures of air and, A., 25.  
 catalytic action of hydrogen on flames of, A., 234.  
 decomposition of, on reduced nickel, A., 815.  
 oxidation of, A., 916.  
   catalysts for, A., 704.  
   by copper oxide, B., 215.  
 catalytic reduction of, A., 831.  
 reactivity of, A., 1091.  
 photochemical reaction of, with ammonia and with amines, A., 349.  
   with hydrogen and oxygen, A., 918.  
 catalytic combination of oxygen and, on platinum, A., 704.  
 combination of oxygen and, under influence of radon, A., 822.  
 conversion of, into dioxide by green and mixed hemins, A., 182.  
 diethylacetal, rearrangement products of, A., 363.  
 removal of, from gases, (P.), B., 9.  
   with bacteria, B., 296.  
 compressed, physical properties of, A., 220.  
 poisoning. See under Poisoning.  
 detection and determination of, in air, B., 504.  
   apparatus for, (P.), B., 935.  
 determination of, A., 354, 488, 633.  
   in ethylene, B., 250.  
**dioxide**, molecular structure of, A., 680.  
 molecules, field of force and form of, A., 216.  
 relaxation of vibrational energy of, A., 1080.  
 sensitisation by chlorine of photochemical formation of, A., 1005.  
 preparation of potassium chloride and, by the Engel-Precht method, B., 144.  
 manufacture of, (P.), B., 600.  
   from the monoxide, (P.), B., 22.  
   and sulphite liquor, (P.), B., 725.  
   corrosion problems in, B., 339.  
   generator for, A., 1227.  
 purification of, (P.), B., 725.  
   from fermentation, (P.), B., 936.  
 dehydration and purification of, (P.), B., 725.  
 infra-red dispersion of, A., 982.  
 infra-red absorption spectrum of, A., 982.  
 band spectrum of, A., 1187.  
 emission spectrum of, A., 107.  
 Raman spectrum of, A., 1188, 1189.  
 vibrational specific heat of, A., 684.  
 heat of formation of carbon-oxygen linking in, A., 998.

**Carbon dioxide**, liquid, transmission of, A., 673.  
 electrical breakdown experiments with, A., 983.  
 as a refrigerant, B., 659.  
 solidification of, (P.), B., 261, 506.  
   apparatus for, (P.), B., 146.  
 solid, manufacture of, B., 1077; (P.), B., 181, 228, 261, 383, 466, 981.  
 production of blocks of, (P.), B., 341.  
 treatment of, (P.), B., 305.  
 temperature of, A., 713.  
 evaporation of, (P.), B., 936.  
 use of, in brewing and bottling, B., 933.  
 as a refrigerant, B., 659; (P.), B., 374.  
 use of, in cold storage, B., 47.  
 adsorption of, by charcoal, A., 1084.  
   from mixed gases with alkali carbonate solutions, (P.), B., 600.  
   by gold, A., 223, 1199.  
 velocity of absorption of, by potassium and sodium hydroxide, A., 577.  
   in water and alkalis, A., 916.  
 determination of tension of, in liquids, A., 102.  
 equilibria of, with ammonia and water, A., 229.  
   with ammonia and carbamide, A., 23.  
   with calcium oxide, A., 1090.  
   with hydrogen sulphide, A., 1218.  
   with methyl ether and with propylene, A., 800.  
 entropy of, A., 1205.  
 velocity of sound in, A., 328.  
 flame speed of mixtures of oxygen and, A., 815.  
 explosions caused by, in mines, B., 630.  
 photochemical reduction of, in aqueous solution, A., 1006.  
 reduction products of, (P.), B., 886.  
 leakage of, through rubber tubes, B., 903.  
 removal of, from coal gas, B., 214.  
 stability of, in sea water, A., 1228.  
 effect of, on transient diseases of fruit and vegetables, B., 1048.  
 assimilation of, A., 98.  
 graphic registration of production of, by men and animals, A., 955.  
 determination of tension of, in blood, A., 411.  
 effect of respiration of, on gas metabolism, A., 530.  
 detection and determination of, in air, B., 504.  
 determination of, A., 136, 354.  
   apparatus for, A., 1222; B., 546.  
   potentiometrically, in gas mixtures, A., 1222.  
   in mixed gases, A., 488.  
   in hypochlorites, B., 545.  
   in sea water, A., 922.  
 oxides, absorptionspectra of, A., 673, 1075.  
 free energies of, A., 1089.  
**Carbonic acid**, and its salts, photo-reduction of, to formaldehyde, A., 349.  
**Carbonates**, isomorphism of, A., 1079.  
 solid, dissociation of, A., 1003.  
 velocity of formation and decomposition of, A., 577.  
 acid, infra-red absorption spectra of, A., 6.  
   thermal decomposition of, in aqueous solution, A., 234, 477, 703, 1095.  
   natural, determination in, of iron and manganese, B., 382.  
 determination of, in boiler water, B., 819.  
   in soils, B., 199, 361, 906.

**Carbon**:—  
**Carbonate ions**, normal vibrations of, A., 107.  
**Carbon disulphide**, manufacture of, in Spain, B., 180.  
 homogeneity of, A., 905.  
 ultra-violet spectrum of, and its appearance in the solar spectrum, A., 982.  
 change in dielectric polarisation of, with temperature, A., 9.  
 ionisation of, by electron impact, A., 983.  
 heat of formation of carbon-sulphur linking in, A., 998.  
 two liquid states of, A., 329.  
 adsorption of, by active charcoal at low pressures, A., 223.  
 combustion of, in oxygen, A., 25.  
 catalytic decomposition of, by hydrogen and steam, A., 1213.  
 effect of foreign gases on critical oxidation pressure of, A., 1093.  
 reactions of, A., 145.  
 reaction of, with acetone, A., 145.  
   with sodium hydroxide, B., 16.  
 detection of, A., 243, 1222.  
 determination of, iodometrically, A., 243.  
   in benzene, B., 711.  
 oxysulphide, removal of, from gases, (P.), B., 600.  
**Carbon determination**:—  
 determination of, A., 410.  
   by dry method, A., 954.  
   microchemically, A., 71, 72, 417, 1051, 1149, 1269.  
   in biological fluids, A., 550.  
   in explosive liquids, A., 1051.  
   in fermented liquors, B., 1102.  
   in plant tissues, A., 102.  
   in organic compounds, A., 72, 291, 867.  
   magnetically, in steel, B., 469.  
   in water, B., 818.  
**Carbon black**, manufacture of, B., 631; (P.), B., 135, 170, 328, 457, 490, 633, 828.  
   apparatus for, (P.), B., 970.  
   adsorption by, of moisture, B., 1015.  
   of vulcanisation accelerators, B., 631.  
   effect of grit in, on flexing resistance of rubber, B., 631.  
   testing of, B., 1063.  
**Carbon linkings**, double, Raman effect with, A., 559.  
**Carbonaceous materials**, carbonisation of, (P.), B., 921.  
   apparatus for, (P.), B., 1017.  
   in retorts, (P.), B., 969.  
 distillation of, (P.), B., 490.  
   apparatus for, (P.), B., 921.  
 cracking of vapours from, (P.), B., 923.  
 destructive distillation of, (P.), B., 827.  
 gasification of, (P.), B., 490.  
 gasification and distillation of, underground, (P.), B., 457, 667.  
 activation of, by gases, (P.), B., 8, 54.  
 degasification of, (P.), B., 457.  
 heat-treatment of, (P.), B., 89, 489.  
   gases containing hydrogen for, (P.), B., 299.  
 hydrogenation of, (P.), B., 171, 1017.  
 catalytic hydrogenation of, (P.), B., 55, 828.  
 destructive hydrogenation of, (P.), B., 54, 410, 667.  
 catalytic destructive hydrogenation of, (P.), B., 761.  
 relation between composition of, and their yield of crude oil, B., 408.

- Carbonaceous materials**, removal of, from oil cracking plants, (P.), B., 11.  
 sorting of, (P.), B., 585.  
 liquefiable, coking of, (P.), B., 89.  
 liquid, distillation of, (P.), B., 924.  
 destructive hydrogenation of, (P.), B., 8, 136, 217.  
 solid, distillation of, (P.), B., 585.  
 apparatus for, (P.), B., 711.  
 destructive hydrogenation of, (P.), B., 8.
- Carbonisation**, (P.), B., 298.  
 apparatus for, (P.), B., 8, 1017, 1065.  
 gas offtakes for, (P.), B., 330.  
 of fuels, (P.), B., 585.  
 of solid or mixtures of solid and liquid materials, (P.), B., 536.  
 low-temperature, B., 758.  
 by the "lead-bath" and Gray-King methods, B., 583.  
 by Salerni system, B., 167, 487, 789.  
 of fuels, (P.), B., 873.
- Carbonisation retorts**. See under Retorts.
- Carbonyls**, magnetism of, A., 10.  
 toxicity of, A., 878.
- Carbonyl chloride** (*phosgene*), photochemical formation of, at low pressure, A., 1006.  
 adsorption of, by charcoal in gas masks, B., 706, 1010.  
 compounds, absorption spectra of, A., 1188.  
 ultra-violet absorption spectra and chemical properties of, A., 982.  
 prototropy in, A., 129, 577.  
 metallic derivatives of, A., 143, 831.  
 determination of, by formation of 2:4-dinitrophenylhydrazones, A., 411.  
 hydroxy-, A., 852, 858.  
 selenide, A., 329.  
 sulphide, physical properties of, A., 329, 449.  
 infra-red absorption spectrum of, A., 444.  
 Raman effect and structure of, A., 320.  
 photochemical dissociation of, A., 820.
- NN'-Carbonyl-6:8'-diamino-2:2'-ditolyl**. See 2-Keto-7:8-dimethyl-2:3-dihydrophenimidine.
- Carborundum**, electron distribution in, A., 902.  
 manufacture of, B., 1031.  
 production of electrical resistance elements from, (P.), B., 1089.  
 determination in, of free silicon, B., 24.
- Carbostyryl-3-carboxylic acid**, 6:8-dinitro-derivative, and its ethyl ester, A., 528.
- 4-(5'-Carboxyanilino)-2-phenylquinoline**, 4:4'-hydroxy-, A., 623.
- 4- $\alpha$ -Carboxyanilinopyridine**, 3:5-dibromo-, ethyl ester, A., 623.
- $\alpha$ -Carboxybenzaldehyde** 5-nitro-*o*-tolylhydrazones, lactone of, A., 405.
- 3-*m*-Carboxybenzenazo-2:4-dihydroxyquinoline**, A., 623.
- 3-Carboxybenzenohomophthalimide**, A., 624.
- 3'-Carboxybenzoylbenzoic acid**, *o*-4'-hydroxy-. See Benzophenone-3:2'-dicarboxylic acid, 4-hydroxy-.
- $\alpha$ -Carboxybenzoylfluoranthenes**, and their derivatives, A., 847.
- $\alpha$ -Carboxy- $\alpha$ -benzylsuccinic acid**, triethyl ester, A., 1131.
- $\alpha$ -Carboxycamphocean- $\beta$ -propionic acid**, lead salt, thermal decomposition of, A., 1037.
- 6-Carboxy-5- $\alpha$ -carboxyphenylpyrazine-2-acetic acid**, A., 952.
- 5-Carboxycinnamic acid**, 2-hydroxy-, and its silver salt, A., 946.
- Carboxydehydro-*n*-butyrylacetic acid**, and its potassium salt, A., 1256.
- 2-Carboxy-4:5-dimethoxyphenoxycetic acid**, and its dimethyl ester, A., 383.
- 3-Carboxy-1:1-dimethylcyclopropane-2-propionic acids**, A., 739.
- 2-Carboxy-3:4-dimethylpyrrole-5-carboxylic acid**, ethyl ester, A., 173.
- 5-Carboxy-2:4-dimethyl-3-pyrrylacetone**, A., 861.
- 2-Carboxydinaphthyl ketones**, and their acetoxylactones, A., 747.
- 3-Carboxydiphenyl sulphide**, 4-hydroxy-, A., 844.
- 1-Carboxydiphenylene oxide**, A., 1121.
- p*-Carboxydiphenylmethylarsine**, and its oxide, A., 528.
- $\alpha$ -Carboxy- $\alpha$ - $\beta$ -diphenylpropionic acid**, and its derivatives, A., 56.
- Carboxyethylaminomethionine acid**, and its salts, A., 1118.
- 3:4'- $\beta$ -Carboxyethyl-4:3'-dimethylmethine**, 5-hydroxy-, A., 1045.
- 5- $\beta$ -Carboxyethylglyoxaline**, manufacture of, from glutamic acid, (P.), B., 878.
- 3-Carboxyfuryl-2-acetic acid**, and its derivatives, A., 519.
- Carboxyglyoxal** 2:4:5-trichlorophenylosazone, A., 625.
- 2-Carboxyhexahydrohydrindene-2-acetic acids**,  $\alpha$ -bromo-, and  $\alpha$ -hydroxy-, and their  $\beta$ -lactones, and their aniline salts, A., 614.
- 1-Carboxycyclohexane-1-acetic acid**,  $\alpha$ -bromo-, and  $\alpha$ -hydroxy-, and its  $\beta$ -lactone, and its derivatives, A., 614.
- 1-Carboxycyclohexane-1- $\alpha$ -propionic acid**, and its derivatives, and  $\alpha$ -hydroxy-, and its  $\beta$ -lactone, A., 614.
- 2-Carboxy- $\Delta^1$ -cyclohexenylacetic acid**, and its derivatives, A., 1128.
- 2-Carboxy- $\Delta^1$ -cyclohexenylmalonamic acid**, ethyl ester, A., 1128.
- $\alpha$ -Carboxy- $\beta$ -hydroxy- $\beta$ -*n*-propylhexolactone**, A., 614.
- Carboxylase**, isolated occurrence of, A., 1169.  
 in plant seeds, A., 1062.  
 kinetics of action of, A., 428.
- 2-Carboxymethoxybenziminazolearsinic acids**, manufacture of, (P.), B., 624.
- 2-Carboxymethoxy-4:5-dimethoxyphenylpyruvic acid**, A., 751.
- 5-Carboxy-4-methyl-2- $\beta$ -carboxyethylpyrrole-3-carboxylic acid**, ethyl ester, A., 861.
- 3-Carboxy-4-methylfuran-2-carboxylamide**, A., 166.
- 1-Carboxymethylcyclohexane-1-acetic acids**, and their derivatives, A., 741.
- $\alpha$ -Carboxy- $\alpha$ -methyl- $\Delta\beta$ -hexenoic acid**, A., 1111.
- 1-Carboxy-3-methylcyclopentane-1-acetic acid**, derivatives of, A., 740.
- $\beta$ -(5-Carboxy-2-methyl-3-pyrryl)propionic acid**, A., 281.
- 2-Carboxymethylthiolmethylglyoxalinecarboxylic acid**, A., 70.
- 3-Carboxy-1-naphthyl methyl ketoximes**, 2-hydroxy-, and their derivatives, A., 743.
- 5-Carboxy-3:4:3':4':5'-pentamethylpyrromethene hydrobromide**, A., 173.
- 1-Carboxycyclopentane-1-acetic acid**,  $\alpha$ -bromo-, and  $\alpha$ -hydroxy-, and its  $\beta$ -lactone, and its derivatives, A., 614.
- 2-Carboxycyclopentane-1-acetic acid**, A., 741.
- 2-Carboxy- $\Delta^2$ -cyclopentene-1-acetic acid**, and its salts, A., 741.
- 4-*p*-Carboxyphenoxyphenylarsinic acid**, A., 1050.
- 4-Carboxyphenoxyphenylarsinic acids**, 3-amino-, and 3-nitro-, A., 1049.
- p*-Carboxyphenyl/bromoarsine**, A., 953.
- $\alpha$ -Carboxy- $\alpha$ -(8-phenylbutyl)succinic acid**, and its triethyl ester, A., 1131.
- 2-( $\alpha$ -Carboxyphenyl)-3-carboxypyridine**, salts of, A., 402.
- $\alpha$ -Carboxy- $\alpha$ -( $\beta$ -phenylethyl)succinic acid**, and its triethyl ester, A., 1131.
- p*-Carboxyphenyl/diodostibine**, A., 867.
- p*-Carboxyphenylmethylthiodoarsine**, A., 528.
- 3'-Carboxyphenyl- $\beta$ -naphthylaminesulphonic acid**, 4'-hydroxy-, sodium salt, A., 265.
- $\beta$ -Carboxy- $\beta$ -phenylpropionic acid**, derivatives of, A., 1131.
- $\alpha$ -Carboxy- $\alpha$ -( $\gamma$ -phenylpropyl)succinic acid**, and its triethyl ester, A., 1131.
- 1-*m*-Carboxyphenylthiocyclo-2:5-dithia-3:4-dimethylenestibine**, A., 867.
- 3-Carboxypiperidinoacetic acid**, and its copper salt, A., 167.
- Carboxypolypeptidases**, separation of proteinases and, B., 239.
- Carboxypropylmethylmethionine acid**, dipotassium salt, A., 1118.
- Carboxyisopropylidenebisthiolacetic acid**, A., 1235.
- Carboxythioacetallamide**, A., 758.
- p*-Carboxythiocarbamide**, A., 55.
- p*-Carboxythio-*S*-methylisothiocarbamide**, A., 55.
- Carbly sulphate**, manufacture of, (P.), B., 1072.
- Carblyamines**, A., 261, 403.  
 structure of, A., 733.
- Carcinoma**. See Cancer.
- Cardboard**, manufacture of containers of, for foods, (P.), B., 882.
- d*- $\Delta^2$ -Carene**, autooxidation of, and its derivatives, A., 61.
- $\Delta^4$ -Carene**, attempted synthesis of, A., 948.
- $\alpha$ - and  $\beta$ -Carenes**, B., 864.
- Carica papaya***, proteolytic enzymes of, A., 92.
- Caries in rats**, effect of phosphorus intake and blood-phosphorus concentration on, A., 296.  
 See also Dental caries.
- Carnallite**, electrolytic extraction of magnesium from, B., 387.  
 solubility of, A., 1091.
- Carnauba wax**, emulsification of, B., 850.
- $\alpha$ -Carnegieite**, crystal structure of, A., 218, 451.
- Carnosine**, methyl derivative, chloroaurate of, A., 863.
- Carnotite**, determination in, of uranium, B., 598.
- Carotenase**, A., 97.
- Carotene**, A., 619.  
 isolation of, A., 437.  
 from adrenal glands, A., 76.  
 in carrots, A., 1178.  
 in mango fruit, A., 1178.  
 in palm oil, A., 203.  
 isomeric forms of, and their relation to vitamin-A, A., 1256.  
 isomerisation of, by means of antimony chloride, A., 1174.  
 relation between ergosterol and, A., 737.  
 and vitamin-A, A., 200, 657, 972, 1069, 1174.  
 transformation of, to vitamin-A, A., 97.  
 formation of vitamin-A from, in the organism, A., 973.  
 prophylactic dose of vitamin-A in form of, A., 1069.  
 effect of, on glycolysis, A., 1278.  
 on oxidation of linoleic acid, A., 782.

- Carotene, effect of magnesium salts with, on growth of rats, A., 963.  
oxidised, as hydrogen acceptor, A., 651.  
determination of, in serum, A., 636.  
*α*-Carotene, A., 520.  
*β*-Carotene, oxidation of, and hydroxy-, A., 749.  
*iso*Carotene, A., 782.  
Carotenes, hydrogenation of, A., 619.  
Carotenoids, A., 520.  
physical chemistry of, A., 694.  
absorption spectra of, A., 516.  
Raman spectra of, A., 320.  
adsorption of, A., 694.  
synthesis of, in plants, A., 976.  
in berries, A., 785.  
of flowers, A., 1257.  
in animal and plant organs, A., 973.  
in serum and organs of higher animals, A., 433.  
in relation to growth, A., 781.  
and sex hormones, A., 1068.  
Carr-Price reaction with, A., 547.  
determination of, A., 785.  
*β*-Carotene, and its dioxime, A., 749.  
Carp, lipase from organs of, A., 776.  
*Carpocapsa pomonella*, toxicity of insecticides to, B., 1130.  
*Carpotroche brasiliensis*, chaulmoogric acid in oil of, B., 686.  
*Carpotroche* oil, B., 515.  
Carrots, respiration of tissues of, in buffer solutions, A., 312.  
carotene content in, A., 1178.  
home-canned, antiscorbutic vitamin in, A., 434.  
Cartilage, constituents of, A., 532.  
phosphatase and pyrophosphatase of, A., 870.  
Cartridges, shot, cases for, (P.), B., 625.  
shot-gun, (P.), B., 290, 401, 1105.  
wads for, (P.), B., 450.  
Carvacrol-6-azo-*p*-phenylarsinic acid, and its salts, A., 528.  
Carvenolenic acid, constitution of, and its methyl ester, A., 398.  
Carvenolic acid, methyl ester, A., 398.  
Carvenololactone, *Δ*hydroxy-, A., 398.  
Carvenone, autooxidation of, and its derivatives, A., 398.  
Carvone, autooxidation of, and its derivatives and polymers, A., 1139.  
Carvone, hydroxy-, derivatives of, A., 1139.  
*d*- and *l*-Carvones, rotation of aqueous extracts of solutions of *r*-mandelic acid in, A., 1197.  
solubility of *r*-mandelic acid in, A., 848.  
Caseara sagrada, therapeutic activity and Borntraeger colour reaction of, B., 447.  
Case-hardening, nitrogen, B., 605.  
Casein, A., 762.  
optical activity of, B., 1134.  
effect of temperature and time of drying on solubility of, B., 1134.  
viscosity of solutions of, B., 701.  
of low viscosity, production of, (P.), B., 526.  
gels, plastic properties of, A., 20.  
sols, coagulation of, by alcohols, A., 1202.  
effect of salts on alkaline solutions of, A., 911.  
separation of albumin and, in milk, B., 159.  
use of, in plastics, B., 687.  
hardening of plastic masses of, (P.), B., 949.  
colouring of hardened masses from, (P.), B., 1042.  
horn-like material from, (P.), B., 1042.  
Casein, food, manufacture of, B., 399.  
paper-coating, effect of calcium and phosphorus on adhesive strength of, B., 795.  
soluble, (P.), B., 127.  
analysis of, B., 748.  
Caseinogen, adsorption of metallic salts by, A., 17.  
solubility of, A., 73.  
decomposition of, by lactic streptococci, A., 653.  
in resorcinol, A., 529.  
peptic degradation of, A., 638.  
optical activity and coagulation of degradation products of, A., 631.  
action of alkalis on, A., 465.  
effect of salts on alkaline solutions of, A., 911.  
preparation of methionine from, A., 1148.  
action of blood and organ extracts on, A., 777.  
vitamin-A-free, preparation of, A., 1175.  
determination of phosphorus in, A., 533.  
Caseinogenates, alkali, ultrafiltration of electrolytes from solutions of, A., 119.  
Cashew-nut shells, composition for varnishes, etc., from, (P.), B., 650.  
Cashew-nut-shell oil, manufacture of electrical insulating materials from, (P.), B., 900.  
*Cassia florida*, lac infection of, B., 851.  
Cassia oil, determination of adulterative esters in, B., 161.  
Cassiterite, A., 494.  
and its solubility in distilled water, A., 1229.  
*Castanea mollissima*. See Chestnut trees, Chinese.  
Castings, testing of, B., 509.  
gas-free and oxide-free, production of, (P.), B., 112.  
Castor oil, cryoscopic determination of molecular weight of, B., 648.  
extraction of, by solvents from seeds, B., 805.  
deterioration of, B., 233.  
acidity of, B., 474.  
utilisation of, B., 194.  
use of, as a lubricant, B., 233.  
as source of perfume aromatics, B., 516.  
amino-sulphonated, silver salt of, (P.), B., 241.  
Chinese, syntheses from, A., 932.  
Castor-oil fish. See *Ruvetris pretiosus*.  
Castoreum, B., 1008.  
Castration, vitamin-A deficiency in rats in, A., 1293.  
Catalase, A., 1062.  
classification of types of, A., 1286.  
isoelectric point of, A., 775.  
decomposition of hydrogen peroxide by, A., 880.  
gas burette for apparatus for, A., 1286.  
activator of, A., 775.  
activity of, in relation to growth curve of barley, A., 784.  
as agent for economy of oxygen consumption, A., 182.  
in adrenalectomy and Addison's disease, A., 535.  
influence of dyes on formation of, by bacteria, A., 1067.  
in Swedish brewing barley, B., 364.  
of blood-plasma, A., 765.  
of leucocytes, A., 412.  
in seeds, A., 887.  
milk, changes in activity of, on heating, B., 45.  
Roeder's thymol test for, B., 1051.  
detection of, in milk, B., 1052.  
determination of, in blood, A., 530.  
Catalpa, effect of black locust tree on growth of, B., 618.  
Catalysis, B., 291.  
relation of adsorption to, A., 1095.  
by acids in aqueous and aqueous-alcoholic solutions, A., 917.  
at active surfaces, A., 346.  
in inert solvents, A., 578.  
acid and base, theory of, A., 1004.  
asymmetric, with organic fibres, A., 1062.  
complex, A., 704.  
contact, theory of, A., 1004.  
report on, A., 1004.  
enzymic, chain reactions in, A., 917.  
heterogeneous, of binary gas reactions, A., 579, 819.  
homogeneous, medium changes in, A., 346.  
of gas reactions, A., 917.  
non-metallic, hydrogenation and dehydrogenation, A., 1095.  
Catalysts, manufacture of, (P.), B., 86, 404, 1028.  
chamber for, A., 492.  
determination of surface of, A., 689.  
effect of lattice deformation on activity of, A., 28.  
shifting of equilibria by, A., 818.  
regeneration of, (P.), B., 831.  
for dehydrogenation, manufacture of, (P.), B., 261.  
chromium-nickel, reactions of ethyl alcohol on, A., 819.  
copper-chromium oxide, hydrogenation, preparation of, A., 477.  
ferric oxide and ferric oxide-chromium sesquioxide, for production of hydrogen, A., 578.  
heavy metal, A., 346.  
heterogeneous, impulse phenomena on, A., 818.  
iron, activation of, by aluminium oxide, A., 1004.  
for ammonia synthesis, A., 1004.  
organic, similarity of enzymes and, A., 236.  
silica porous, production of, (P.), B., 886.  
vanadium, production of, B., 145.  
complex, B., 463.  
Catalytic apparatus, (P.), B., 372, 404, 820.  
hydrogenation, A., 477.  
velocity of, A., 347.  
in alcohol, A., 819.  
with copper-chromium oxide catalysts, A., 477.  
with sodium hydride, A., 819.  
reactions, (P.), B., 163.  
classification of, A., 1231.  
carrying-out of, (P.), B., 964.  
with electric discharges, (P.), B., 1038.  
at high temperature and under high pressure, A., 268.  
between solids, A., 705.  
exothermic, apparatus for, (P.); B., 164.  
carrying-out of, (P.), B., 660.  
application of, in analysis, A., 591.  
reduction, quantitative, apparatus for, A., 593.  
Cataphoresis, measurement of, A., 806.  
by moving boundary method, A., 336.  
speed of, A., 225, 464.  
Cataract, lens-proteins in, A., 641.  
Catechins, gambier, B., 1000.  
Catechol. See Pyrocatechol.  
Cathepsin of horse lymph glands, A., 91.  
Cathodes, evaporation at, in a magnetic field, A., 211.  
for vacuum tubes, (P.), B., 944.  
barium oxide, activity of, A., 1189.  
copper, periodicity of potential of, A., 814.

- Cathodes**, electron-emitting, production of, (P.), B., 733.  
 glowing, distribution of emission from, A., 1184.  
 dropping mercury, polarographic studies with, A., 586, 1093, 1221.  
 oxide, (P.), B., 804.  
 thermionic emission and electrical conductivity of, A., 110.  
 platinum, in nitric acid, reactions at, A., 705.  
 platinum-nickel, (P.), B., 114.  
 thermionic, (P.), B., 114, 611, 992, 1038, 1089.  
 production of, (P.), B., 944.  
 indirectly heated, (P.), B., 945.  
 tungsten, current intensity from, A., 1184.  
 two-component, selective photo-electric effect from, A., 3.
- Catskins**, post-mortem changes of, B., 316.
- Cattle**, feeding-stuff for, (P.), B., 127.  
 amount of feed consumed by, in relation to energy content, A., 1161.  
 ochronosis of, A., 81.  
 intra-uterine development in, A., 1153.  
 store, feeding-stuffs for fattening of, B., 445.
- Cauliflowers**, growth of, in relation to soil acidity, B., 568.
- Cebollite** of Colorado, A., 1229.
- Cedar**, white, chemistry of fruit of, A., 665, 784.
- Cedarwood oil**, Japanese, sesquiterpene from, A., 277.  
 thickened, substitute for, B., 391.
- Cedrol**, and its derivatives, B., 321.
- Celerio lineata**, toxicity of poisons to larvae of, B., 570.
- Celery**, protection of, from injury by tarnished plant bug, B., 813.  
 carbohydrate and nitrogen metabolism in, A., 1295.
- Cell or Cells**, electrochemical, B., 848; (P.), B., 514, 732, 775, 992, 1089.  
 theory of, A., 231.  
 production of, (P.), B., 776.  
 distribution of current in, A., 1208.  
 electrolytic solution pressure and voltaic potentials in, A., 24.  
 wedged cell container for, (P.), B., 390.  
 depolarisers for, (P.), B., 993.  
 diaphragms for, (P.), B., 646.  
 initial-discharge device for, (P.), B., 732.  
 permeable coatings for use in, (P.), B., 804.  
 concentration, with ternary electrolyte, A., 471.  
 conductivity, (P.), B., 114.  
 copper, periodicity in, A., 1208.  
 dry, (P.), B., 433.  
 manufacture of, (P.), B., 432.  
 sealing of, (P.), B., 390.  
 production of carbon dummies for, (P.), B., 848.  
 treatment of containers for, (P.), B., 611.  
 wrapping for cores of, (P.), B., 390.  
 depolarisers for, (P.), B., 514.  
 use of electrolytic manganese dioxide as, B., 1038.  
 electrolyte for, (P.), B., 944.  
 Leclanché electrolyte for, (P.), B., 944.  
 manganese dioxide for, B., 431.  
 of the Leclanché type, (P.), B., 514.  
 galvanic, (P.), B., 897.  
 containing hydrochloric acid, potential of, A., 700.  
 Lalande, (P.), B., 897.  
 Leclanché, electrolyte for, (P.), B., 646.  
 mercury sulphate, potential of, A., 915.
- Cell or Cells**, electrochemical, primary, depolarisers for, (P.), B., 268.  
 air-depolarised, with caustic alkali electrolyte, B., 991.  
 semi-conducting, lead chloride, A., 24.  
 silver-quinhydrone, potential of, A., 999.  
 silver-silver chloride, potential of, A., 1000.  
 standard, acid, unsaturated, A., 126.  
 Weston, potential of, A., 471.  
 zinc, zinc sulphate, lead sulphate, lead, potential of, A., 126.
- Cell or Cells**, photo-electric, A., 713; (P.), B., 114, 433, 685, 734, 776, 804, 897, 945, 946, 992, 1038.  
 manufacture of, (P.), B., 514.  
 electrodes for, (P.), B., 114, 192.  
 contact clip for, (P.), B., 353.  
 law of equidistance in, A., 126.  
 and internal photo-effect, A., 560.  
 glow in, A., 1072.  
 increase of current in, by gas discharge, A., 8.  
 discontinuous variation in potential of, A., 126.  
 control of temperature with, B., 1037.  
 use of, (P.), B., 514.  
 in chemical engineering, B., 558.  
 in paper manufacture, B., 674.  
 application of, to titrations, A., 924.  
 for X-ray investigation of liquids, A., 1012.  
 for micro-acidimetry, A., 1012.  
 with alkali cathodes, A., 669, 983.  
 chromium-selenium, A., 1077.  
 constant-temperature, for microscopy, A., 1012.  
 copper-cuprous oxide, A., 793.  
 copper grating, sensitivity of, and comparison with copper oxide cells, A., 8.  
 cuprous oxide, A., 8, 560, 898; (P.), B., 733.  
 deteriorated, restoration of, (P.), B., 268.  
 gas-filled, lag in, A., 208.  
 Kerr, (P.), B., 848.  
 nitrobenzene "Kerr," physics of, A., 111, 561.  
 potassium, sensitivity limit of, A., 893.  
 selenium, (P.), B., 734.  
 sodium salicylate-sensitised, intensity measurements with, A., 319.  
 Sperschicht type of, A., 1012.  
 titanium, use for, A., 1077.
- Cell or Cells**, physiological, nuclei of, A., 544.  
 effect of  $pH$  and of soap solutions on growth of, A., 1283.  
 effect of reagents on size of, A., 294.  
 measurement of permeability of, A., 1162.  
 action of cancerous and embryonic extracts on, A., 80.  
 poisoning of, by arsenic, A., 537, 880.  
 animal, anomalous osmosis in, A., 877.  
 fixed, staining of, A., 766.  
 living, perfusion of, A., 539.  
 plant. See Plant cells.
- Cellan**, structure of, A., 604.
- Cellobionic acid**, salts, A., 501.
- Cellobiose**, synthesis of, A., 1021.  
 alkaline degradation of, A., 148.  
 anhydride, A., 46.  
 thiosemicarbazone, A., 501.
- Cellodextrin**, identity of oxycellulose with, A., 604.
- Cellodextrins**, methylated, chain-length of, A., 1116.
- Celloidin**, use of, in botany, A., 666.
- Cellophane**, fading of dyes on, B., 1116.
- Cellosolve**, use of, in analysis of fats, B., 946.
- Cellotriase**, A., 1116.
- Cellular products**, manufacture of, (P.), B., 263.
- Cellulase**, action of, on plant materials, A., 649.
- Celluloid**, formation of, A., 568.  
 recovery of alcohol in manufacture of, B., 59.  
 transparent sheets of, (P.), B., 357.  
 manufacture of substitutes for, (P.), B., 16, 500.
- Cellulose**, A., 370, 501, 1117; B., 255.  
 molecular structure of, A., 370, 1022.  
 structure of lignin and, B., 928.  
 and its derivatives, constitution of, A., 1238.  
 isomerism of, A., 934.  
 intermediate products in formation of, A., 47.  
 preparation of, from maize stalks, using nitric acid, B., 222.  
 manufacture of, (P.), B., 97, 499, 543, 719.  
 from bagasse, etc., (P.), B., 501.  
 from fibrous materials, (P.), B., 16.  
 from lignified material, (P.), B., 142.  
 from *Musa* fibres, (P.), B., 499.  
 from straw, (P.), B., 501.  
 from sugar canes, (P.), B., 796.  
 from wood, straw, etc., (P.), B., 976.  
 extraction of, by chlorination, B., 593.  
 recovery of, from wood chips, etc., (P.), B., 881.  
 separation of, from treating liquids, (P.), B., 461.  
 from wood, B., 15.  
 control of quality of, in sulphite cooking, B., 673.  
 uncondensable gases from cooking of, B., 929.  
 drying of, B., 766.  
 effect of soaps on electric moment at aqueous interfaces of, A., 804.  
 and its nitrate, determination of heat of combustion of, A., 229.  
 specific volume of, and of its mixtures with water vapour, A., 1087.  
 and its acetate, adsorption of alcohol vapour by, A., 1084.  
 adsorption of metallic cations by, A., 908.  
 adsorption of tannin by, B., 1127.  
 adsorption of water vapour by, and its derivatives, A., 690.  
 hygroscopic moisture of, B., 140, 766, 880.  
 plasticity of, A., 564.  
 viscosity of, A., 335.  
 in solution, A., 465, 1117.  
 and its nitrates, effect of treatment of linters on, B., 1073.  
 viscosity of dispersions of, in zinc chloride, A., 336.  
 characterisation of, by its solubility, B., 140.  
 insolubility of, in neutral salt solutions, B., 255.  
 cuprammonium solutions of, A., 702, 725; B., 541.  
 gels, structure of, A., 693.  
 and its derivatives, lyophilic properties of, B., 880.  
 swelling of, in alkali, B., 140, 880.  
 acetolysis of, A., 47, 1022, 1116.  
 acetylation of, B., 795, 880; (P.), B., 303.  
 benzylation of, (P.), B., 768.  
 "coalification" of, B., 245, 917.  
 degradation of, A., 502.  
 depolymerisation of, during ageing, B., 498.

Cellulose, esterification of, (P.), B., 880.  
 ethylation of, (P.), B., 500.  
 nitration of, B., 880, 1022.  
 oxidation of, A., 149.  
 saccharification of, (P.), B., 443.  
   by the Tornesch process with dilute acids, B., 745.  
   influence of pressure on, B., 910.  
   velocity of xanthation of, B., 498.  
 and its derivatives, reaction of, with dyes, A., 1238.  
 action of, with fluorosulphonic acid, A., 1022.  
   with hydrogen fluoride, A., 604.  
   with sodium carbonate, B., 637.  
 formation of water-soluble dextrans from, A., 1022.  
 determination of composition of additive compounds of, A., 1022.  
 production of shrinkable capsules of, (P.), B., 768.  
 manufacture of colourless solutions or shaped articles from, (P.), B., 543.  
 manufacture of compositions from, (P.), B., 719.  
 manufacture of films, strips, etc., from, (P.), B., 543.  
 manufacture of films, etc., from, dissolved in Schweitzer's reagent, (P.), B., 1024.  
 manufacture of hollow articles from, (P.), B., 795.  
 pure, production of membranes, etc., from, A., 713.  
 production of moisture-proof transparent material from, (P.), B., 795.  
 and its derivatives, manufacture of striped ribbons from, (P.), B., 1074.  
 apparatus for production of artificial skins from, (P.), B., 720.  
 preparation and properties of artificial sponges from, A., 123.  
 manufacture of artificial threads, etc., from solutions of, (P.), B., 225.  
 production of threads, foils, etc., from aqueous solutions of, (P.), B., 500.  
 chemistry of, in relation to pulp and paper, B., 177.  
 for paper, sources of, B., 836.  
 decomposition of, in soils, B., 692.  
 bacterial decomposition of, A., 307.  
 thermophilic fermentation of, A., 651.  
 from action of *Acetobacter xylinus* on glucose, structure of, A., 256.  
 fungi decomposing, A., 195.  
 relation of, to lignin, in wood, A., 605.  
 digestion of, in ruminants, A., 968.  
 silver number of, B., 716.  
 determination of, in flour, etc., B., 444.  
   in plant materials, B., 618.  
   in soils, A., 1179.  
 Cellulose, alkali, A., 836.  
   production of, (P.), B., 767.  
   depolymerisation of, B., 835.  
   xanthation of, B., 16.  
   determination of hemicellulose in spent liquors from, B., 499.  
 bamboo, B., 1022.  
   hygroscopic moisture of, B., 766.  
 cotton, least equivalent of, A., 149  
   adsorption of anthraquinone derivatives by, A., 224.  
 cotton and wood, methylation of, A., 934.  
 exhausted, A., 604.  
 fibrous, separation of, from plant substances, B., 177.  
 Kaoliang, B., 255.  
 natural, texture of, B., 593.  
   chain length of, A., 934.  
 oxidised, optical rotation of, A., 47.  
 pine-wood, swelling of, in water, A., 122.

Cellulose, ramie, net density of, B., 717.  
 regenerated, B., 638.  
   cutting of films of, (P.), B., 98.  
   treatment of films, sheets, etc., of, (P.), B., 930.  
   treatment of materials of, with caustic alkalis, (P.), B., 258.  
   treatment of threads of, (P.), B., 98.  
   waterproofing of sheets of, (P.), B., 929, 1027, 1075.  
   production of colour effects on, by means of light, (P.), B., 1009.  
   impregnation of fabrics with, (P.), B., 338.  
   manufacture of transparent-foils, films, wrapping materials, etc., from, (P.), B., 1074.  
 rice-straw, B., 255.  
 soda-, production of, for conversion into viscose, (P.), B., 977.  
   depolymerisation of cellulose during ageing and xanthation of, B., 255.  
   maturation of, B., 638.  
   action of alcohols on, A., 725.  
   action of oxygen on, B., 638.  
 soda- and sulphate-, refining of soap from waste liquors from, (P.), B., 561.  
 sulphite-, manufacture of, (P.), B., 224.  
   liquors for, (P.), B., 462.  
   boiling of, (P.), B., 416.  
   liberation of ligninsulphonic acid from, B., 415.  
   disposal of waste liquors from, B., 766.  
   determination of degradation of, B., 222.  
   detection of, in tannin extracts, B., 359, 809.  
   determination of free and combined sulphurous acid in bisulphite liquors from, B., 178.  
 wood, A., 934.  
   deterioration of, by bleaching, B., 766.  
 Cellulose fibres, structure of, B., 143.  
   morphology of, A., 20.  
   manufacture of, (P.), B., 719, 795.  
   from wood pulp, (P.), B., 543.  
   for preparation of esters, (P.), B., 638.  
   treatment of, (P.), B., 1024.  
   with alkali, (P.), B., 338.  
   wetting agents for mercerising liquors for, (P.), B., 337, 839, 978.  
   purification of, (P.), B., 795.  
   of low viscosity, manufacture of, (P.), B., 838.  
   acetylation of, B., 498.  
   action of alkaline mercerising liquors on, (P.), B., 978.  
   action of reagents on, A., 234.  
   production of mats, etc., from, with foaming agents, (P.), B., 768.  
   artificial, wetting-out agents for, (P.), B., 99.  
   delustering of, (P.), B., 597.  
   natural and artificial, wetting agents for treatment of, with alkali, (P.), B., 503.  
 films, production of flexible water-proof coatings on, (P.), B., 997.  
 materials, cleansing of, (P.), B., 256.  
   drying of, (P.), B., 16.  
   treatment of, (P.), B., 932.  
   grinding of, (P.), B., 543.  
   hygroscopic properties of, B., 880.  
   increasing strength and resistance to moisture of, (P.), B., 502.  
   optical rotation of, A., 47.  
   chemistry of, B., 176.  
   decomposition of, (P.), B., 929.

Cellulose materials, digestion of, (P.), B., 976.  
   for production of paper pulp, (P.), B., 98.  
 hydrolysis of, (P.), B., 719.  
 nitration of, (P.), B., 929.  
 pulping of, (P.), B., 639, 768.  
 saccharification of, (P.), B., 77, 97.  
 joining of, (P.), B., 475.  
 decoration of, (P.), B., 20.  
 fireproofing of, (P.), B., 931.  
 drying of articles of, (P.), B., 796.  
 manufacture of dextrans, sugars, etc., from, (P.), B., 1101.  
 production of fermentable liquids from, by hydrolysis, (P.), B., 838.  
 production of sugars from, (P.), B., 42.  
 bacterial isolation of, (P.), B., 97.  
 sheet, production of, (P.), B., 838.  
   waterproofing of, (P.), B., 798.  
 membranes. See under Membranes.  
 pulp, production of, (P.), B., 977, 1025.  
   treatment of, (P.), B., 142.  
   chemical treatment of, (P.), B., 501.  
   refining of, (P.), B., 380.  
   cleansing of, (P.), B., 416.  
 sheets, removal of solvents from, (P.), B., 997.  
   measurement of colour of, B., 1116.  
 threads, production of, (P.), B., 257.  
 immunising of, (P.), B., 722.  
 Cellulose acetate, (P.), B., 416.  
   manufacture of, (P.), B., 335, 674, 1024.  
   free from haze, (P.), B., 977.  
   manufacture of films of, (P.), B., 837.  
   manufacture of threads of, (P.), B., 226.  
   recovery of, from its solutions in acetic acid, (P.), B., 639.  
   fractionation of, B., 223.  
   X-ray spectrum of, A., 904.  
   dielectric polarisation of, in solution, A., 692.  
   influence of water on viscosities of solutions of, B., 302.  
   lowering viscosity of solutions of, (P.), B., 767.  
   viscosity of cellulose and, as measure of progress of acetylation, B., 302.  
   solubility of, in various solvents, A., 336.  
   velocity of solution of, A., 465.  
   solutions, constitution of, A., 1201.  
   osmotic pressure of, A., 909.  
   swelling of, B., 255.  
   swelling and solubility of, A., 462.  
   gels, structure of, A., 995.  
   solution of sols of, A., 225.  
   hydrolysis of, (P.), B., 500, 719.  
   precipitation of, (P.), B., 1024.  
   spinning of, direct from acetylation mixture, B., 379.  
   recovery of volatile solvent in coating with, B., 717.  
   compositions containing, (P.), B., 719.  
   compositions containing carbamate and, (P.), B., 881.  
   composition for sizing of yarns, filaments, etc., of, (P.), B., 19.  
   plasticising of, B., 96.  
   plasticisers for, B., 271, (P.), B., 977.  
   use of, in plastic materials, B., 517.  
   production of plastic masses from, (P.), B., 1042.  
 acetone-soluble, preparation of, B., 16.  
 fractional solution of, B., 766.  
 primary, conversion of, into the secondary acetate, A., 48.  
 determination in, of acetic acid, B., 96.

Cellulose acetate and nitrate, viscosity of sols of, A., 465.  
 acetate II, crystalline, preparation of, A., 47.  
 acetates and chloroacetates, A., 502.  
 compounds with bases, A., 149.  
 derivatives, X-ray examination of, A., 149.  
 manufacture of, (P.), B., 141, 224, 416, 929.  
 grinding of, (P.), B., 1024.  
 surface hardness of, B., 835.  
 rigidity and viscosity of solutions of, A., 122.  
 plasticisers for, (P.), B., 719, 902, 948, 1024.  
 mixing of rubber and, (P.), B., 651.  
 production of articles from, (P.), B., 357.  
 stiffening of fabrics containing, (P.), B., 19.  
 manufacture of filaments, etc., of, (P.), B., 303.  
 production of filaments, films foils, etc., of, from aqueous solutions, (P.), B., 141.  
 manufacture of artificial films and filaments of, (P.), B., 336.  
 manufacture of artificial films, foils, etc., from, (P.), B., 225.  
 production of thin films of, (P.), B., 929.  
 manufacture of materials containing, (P.), B., 416.  
 decoration of materials containing, with metals, (P.), B., 503.  
 delustring of materials containing, (P.), B., 258.  
 composite materials of fibrous materials and, (P.), B., 883.  
 treatment of textile materials containing, (P.), B., 930.  
 production of pattern effects on textile materials containing, (P.), B., 676, 932.  
 delustring of textile materials containing, (P.), B., 19.  
 production of composite sheets of metal and, (P.), B., 60.  
 mouldable compositions from, (P.), B., 1024.  
 manufacture of plastic materials from, (P.), B., 902.  
 manufacture of sheets, etc., from, (P.), B., 721.  
 manufacture of artificial threads from, (P.), B., 141, 417, 881, 1074.  
 manufacture of fine threads from, (P.), B., 17, 257.  
 production of colourless yarns and filaments from, (P.), B., 929.  
 waterproofing of foils from, (P.), B., 1075.  
 cyanogen halide, (P.), B., 501.  
 containing nitrogen, manufacture of, (P.), B., 256, 543.  
 organic, treatment of materials containing, (P.), B., 226.  
 detection of, by solubility differences, B., 1116.  
 esters, manufacture of, (P.), B., 17, 224, 416, 595, 929, 977, 1074.  
 strengthening of fibres of, (P.), B., 258.  
 viscosity of, B., 416.  
 trimethylene glycol dibutyrate as plasticiser for, (P.), B., 901.  
 solvent for, (P.), B., 17.  
 working-up crude solutions of, (P.), B., 225.

Cellulose esters, solution and precipitation of, by homologous organic compounds, A., 465.  
 increasing affinity of, for dyes, (P.), B., 461.  
 manufacture of filaments, etc., from, (P.), B., 17.  
 production of films of, (P.), B., 141.  
 treatment of films of, (P.), B., 719.  
 photographic films from, (P.), B., 449.  
 hydrolysis and weighting of materials containing, (P.), B., 503.  
 partial hydrolysis of textile materials containing, (P.), B., 676.  
 extrusion of sheets of, (P.), B., 902.  
 manufacture of crepéd threads or fabrics containing, (P.), B., 227.  
 manufacture of continuous webs from, (P.), B., 881.  
 ink for marking on, (P.), B., 234.  
 refractometric determination of absorption of organic substances by, B., 717.  
 higher, fatty, A., 836.  
 mixed, production of, (P.), B., 224, 256, 880.  
 analysis of, B., 835.  
 benzyl ester, manufacture of, (P.), B., 17.  
 hydroxyalkyl esters of, (P.), B., 501.  
 esters and ethers, manufacture of, (P.), B., 796.  
 stretching of filaments of, (P.), B., 676.  
 plasticisers for, (P.), B., 461.  
 dry-spinning of, (P.), B., 17.  
 production of filaments, yarns, ribbons, films, etc., of, (P.), B., 258.  
 treatment of filaments, yarns, ribbons, etc., of, (P.), B., 638.  
 production of plastic compositions from, (P.), B., 519.  
 manufacture of sheets or films from, (P.), B., 463.  
 lubrication of textile materials of, (P.), B., 338, 418.  
 production of artificial threads, films, etc., from, (P.), B., 881, 930.  
 ethers, manufacture of, (P.), B., 223, 256, 461, 500, 796.  
 water-sensitivity of, B., 637.  
 formate, B., 1022.  
 glycollate, viscosity of, A., 1086.  
 nitrate (*nitrocellulose*), production of, (P.), B., 529, 881.  
 and its derivatives, (P.), B., 335.  
 fractionation of, by means of aqueous acetone, B., 140.  
 apparatus for digestion of, (P.), B., 1074.  
 heats of formation and combustion of, A., 812.  
 effect of ammonia and amines on viscosity of, in ether-alcohol, A., 1202.  
 plasticisers for, (P.), B., 518.  
 solubility of, B., 835.  
 in acetone and its mixtures, A., 568.  
 in cyclohexanone, *p*-methylcyclohexanone, fenchone, and *m*-xylene, A., 802.  
 slippage of solutions of, A., 119.  
 equilibrium between its nitration acid and, B., 289.  
 decomposition of, A., 725.  
 at room temperature, B., 162.  
 instability of, B., 1105.  
 swelling of, in relation to stability, B., 529.  
 improved Taliani test for stability of, B., 208.  
 stabilisation of, (P.), B., 914.

Cellulose nitrate, denitration of, in mixtures of nitric and sulphuric acids, B., 288.  
 recovery of residual nitric acid from, after centrifuging, B., 752.  
 affinity of, for nitroglycol, B., 289.  
 storage of, B., 578.  
 under water, B., 593.  
 influence of, on refraction of mixed liquids, A., 222.  
 films, structure of, A., 218, 683, 798, 904, 909.  
 formation of, B., 1040.  
 manufacture of, (P.), B., 1024.  
 rendering of, soluble, (P.), B., 416.  
 coatings of cellulose acetate for protection of, against light, (P.), B., 778.  
 increasing durability of coating compositions and films of, (P.), B., 1041, 1091.  
 plastic materials containing, (P.), B., 881.  
 of high solubility in ether-alcohol, preparation of, B., 704.  
 gelatinised, partial vapour pressures of ether and alcohol in, B., 752.  
 stable, preparation of, B., 49, 1105.  
 detection of, in paints and varnishes, B., 356.  
 determination in, of water, B., 241.  
 propionate, manufacture of, (P.), B., 595.  
 sulphates, A., 604.  
 xanthate, production of, (P.), B., 719.  
 from paper, (P.), B., 1024.  
 formation and solution of, B., 499.  
 solution of, in water, B., 140.  
 sodium xanthate, ionic equilibrium of, with semipermeable membranes, A., 334.  
 α-Cellulose, production of fibres of, (P.), B., 16.  
 pulp, production of, (P.), B., 837.  
 determination of, B., 674.  
 in paper, B., 674.  
 β-Cellulose, identity of oxycellulose with, A., 604.  
 least equivalent of, A., 149.  
 α-, β-, and γ-Celluloses, determination of, B., 928.  
 Cellulose-ethylenediamine-copper solutions, replacement of copper by cobalt in, A., 47.  
*Cellvibrio calida*, decomposition of cellulose by, A., 307.  
 Cement or Cements, German standard specification for, B., 468.  
 mineralogy of, B., 183.  
 theory of formation of, B., 344.  
 manufacture of, (P.), B., 25, 106, 183, 889, 984, 1033.  
 by the wet process, B., 183.  
 apparatus for, (P.), B., 727.  
 apparatus for heating raw materials for, (P.), B., 25.  
 in rotary kilns, (P.), B., 424, 727.  
 materials for, in Nyasaland, B., 842.  
 manufacture of ammonium phosphate and, from calcined phosphate, (P.), B., 1078.  
 kilns for, (P.), B., 25, 727.  
 cooling of clinker from, (P.), B., 1060.  
 rotary kilns for, B., 1081; (P.), B., 106, 507.  
 lining bricks for, (P.), B., 507.  
 long slurry ring in, B., 183.  
 rotary kiln and cooler for, (P.), B., 889.  
 rotary tube furnace for calcination of, (P.), B., 25.  
 treatment of, (P.), B., 679.

- Cement or Cements**, treatment of raw material before burning of, (P.), B., 25.  
 fine grinding of materials for, (P.), B., 405.  
 dust collectors for mills for, (P.), B., 1062.  
 grinding of, B., 64.  
 effect of gypsum on high-limed clinker for, B., 183.  
 treatment of sludge for, (P.), B., 937.  
 filtration of slurry of, (P.), B., 1033.  
 mixing of, (P.), B., 773.  
 influence of time of agitation and addition of trass on properties of mixes of, B., 800.  
 baking of, (P.), B., 385.  
 extraction of potassium salts by calcination of, B., 888.  
 setting of, B., 1081.  
   rôle of hydrated calcium aluminates in, B., 549.  
 mill temperature and setting time of, B., 65.  
 acceleration of hardening of, (P.), B., 106.  
 heat evolved in hardening of, B., 1081.  
 colloidal hardening of, B., 263.  
 application of co-ordination theory to chemistry of, B., 1120.  
 absorption of water by, B., 772.  
 reaction between water and, B., 772.  
 hydration of, B., 25.  
 effect of lime on properties of, B., 263.  
 action of Santorin earth on, B., 148.  
 improvement of strength of, B., 25.  
 relation between tenacity and strength of, B., 147.  
 addition of hydraulic materials to, B., 148.  
 hydraulic binding medium for, (P.), B., 985.  
 colouring of, (P.), B., 800.  
 waterproofing of, (P.), B., 1033.  
   compound for, (P.), B., 1082.  
 valved bags for, (P.), B., 6.  
 manufacture of blocks, etc., of, (P.), B., 425, 727.  
 treatment of light porous blocks of, (P.), B., 425.  
 moulding of blocks, slabs, etc., from, (P.), B., 1120.  
 manufacture of glassy-drying substance from, (P.), B., 601.  
 production of glazes from, (P.), B., 938.  
 production of iridescent surface on, (P.), B., 800.  
 manufacture of water-tight roof slabs from, (P.), B., 230.  
 coating of metal pipes with, (P.), B., 191.  
 ratio of water and, in concrete, B., 384.  
 for use at temperatures 55—95°, (P.), B., 984.  
 for oil wells, B., 307, 799.  
   accelerators in, B., 772.  
   substitute for, (P.), B., 984.  
 diaphragms, preparation and properties of, B., 842.  
 products, manufacture and casting of, (P.), B., 184.  
 cool-room for testing of, B., 384.  
 damp cupboard for use in testing of, B., 344.  
 detection and determination in, of free lime, B., 727.  
 determination in, of free lime, B., 344, 468.  
   of free lime with phenol, B., 549.  
   of moisture, electrically, (P.), B., 734.  
**Cement or Cements**, aluminous, B., 549.  
   setting of, A., 1217.
- Cement or Cements**, andesite acid-resistant, preparation of, B., 344.  
 asbestos, production of, B., 937; (P.), B., 425.  
   colouring of, (P.), B., 728.  
   cold glazing of plates of, (P.), B., 679.  
   cellular, production of, (P.), B., 1033.  
   coloured, production of, (P.), B., 106.  
   ferrous, constitution of, B., 148.  
   gypsum, acceleration of hardening of, B., 549.  
   containing alcohols, hardening of, B., 65.  
   high-alumina, B., 148.  
   hydraulic, manufacture of moulded hollow articles from, (P.), B., 184.  
   magnesia, production of, (P.), B., 938.  
   mixed, from Portland cement and arsenious oxide, B., 344.  
   oxychloride, (P.), B., 25.  
   manufacture of, (P.), B., 345.  
   porous, manufacture of, (P.), B., 679.  
   manufacture of bodies of, (P.), B., 601.  
 Portland, manufacture of (P.), B., 25, 106, 773, 1081.  
   from gypsum, B., 101.  
   from anhydrite and gypsum, B., 1081.  
 simultaneous production of iron and, (P.), B., 470.  
 burning of, (P.), B., 727.  
 changes in kilns for, B., 467.  
 production of free lime in, by heating, B., 799.  
 grinding of, (P.), B., 25.  
 fineness and sieving of, B., 344.  
 hardening of, B., 65, 467, 772, 799.  
 Kelly tube in sedimentation of, B., 424.  
 change in setting time of, B., 229.  
 weakening of, B., 147.  
 essential properties of, B., 147.  
 properties of particles smaller than 10 microns in, B., 468.  
 thermochemistry of, A., 23.  
 effect of heat on, B., 799.  
 constancy of volume of, B., 799.  
 hydration of, B., 147.  
 action of sulphates on, B., 642.  
 clinker, specific heat of, B., 1081.  
   effect of magnesia on colour of, B., 772.  
   free lime in, B., 1032.  
   coloured, production of, (P.), B., 889.  
   preparation of thin sections of, for petrographic analysis, A., 247.  
   determination in, of sulphides, B., 344.  
 Portland-alumina, reactions in setting of, B., 1032.  
 puzzuolana, of Rome, B., 148.  
 refractory, B., 64, 679; (P.), B., 728.  
 superfine, multi-chamber mills with air separation for, B., 467.  
 trass-Portland, B., 984.  
 water-setting, production of, (P.), B., 937.  
 water-resistant, manufacture of, (P.), B., 601.
- Cementite**, segregation of, from austenite, A., 330.  
 heat of formation, free energy, and entropy of, A., 1206.
- Centralite**. See *s*-Diphenyldiethylcarbamide.
- Centrifugal apparatus**, bowls for, (P.), B., 372, 581, 629, 822.  
 drums, (P.), B., 1108.  
 extractors. See under Extractors.  
 machines, (P.), B., 4, 132, 293, 453, 662, 868.  
   for paper pulp, etc., (P.), B., 629.  
 pumps. See under Pumps.  
 separators. See under Separators.
- Centrifuges**, (P.), B., 965, 1060.  
 regulation of supply of flushing liquid to, (P.), B., 244.
- Cephalin**. See Kephalin.
- Cephalopods**, phosphagen in developing embryos of, A., 1283.
- Ceramics**, (P.), B., 771.  
 furnaces for, (P.), B., 343.  
 use of butane as fuel in kilns for, B., 1016.
- Ceramic articles**, treatment of, in tunnel kilns, (P.), B., 24.  
 decoration of, with dust gold, (P.), B., 182.  
 moulded, manufacture of, (P.), B., 983.  
 bodies, production of, (P.), B., 423.  
 auxiliary fluxes in, B., 306.  
 of electrical heating devices, B., 105.  
 compositions, (P.), B., 983.  
 increasing plasticity of, (P.), B., 983.  
 of high-strength, (P.), B., 726.  
 masses, manufacture of, (P.), B., 601.  
 materials, production of, (P.), B., 842.  
 drying apparatus for, (P.), B., 726.  
 firing of, (P.), B., 601.  
 dry moulding of, (P.), B., 423.  
 coating of, with copper, (P.), B., 467.  
 sampling of, B., 888.  
 pastes, control of moisture content of, B., 262.  
 products, fuel economy in manufacture of, B., 679.  
 refining of raw materials for, (P.), B., 726.  
 use of phosphoric acid in analysis of raw materials for, B., 1031.  
 use of granites and sienites in, B., 548.  
 acceleration of drying of, B., 24.  
 petrography of, B., 466.  
 white, manufacture of, (P.), B., 423.  
 ware, firing of, (P.), B., 507.  
   electric kilns for, (P.), B., 732.  
   saggers for, (P.), B., 424.  
 heat treatment of, in tunnel kilns and furnaces, (P.), B., 229.  
 drying of, (P.), B., 423.  
 kiln for decoration of, (P.), B., 726.  
 production of terra-sigillata coatings on, (P.), B., 467.  
 bubbles in, B., 771.  
 acid-resisting, use of andesite as substitute for, B., 105.  
 refractory, manufacture of, (P.), B., 182.  
 white, firing of, B., 24.  
   "moisture expansion," of, B., 1080.
- Cerasus lusitanica**. See Laurel, Portuguese.
- Cereals**, growth of, B., 696.  
 nitrogenous fertilisers for, B., 123, 695.  
 phosphate fertilisers for, in relation to soil reaction, B., 953.  
 calculation of effect of superphosphate on, B., 123.  
 prevention of "lodging" of, by potash manuring, B., 567.  
 effect of potash manuring on yield and stiffness of straw of, B., 158.  
 conditioning and drying of, (P.), B., 482.  
 bromine in, A., 205.  
 gums of, B., 1051.  
 iodine in, A., 205.  
 non-protein nitrogen compounds in, B., 747.  
 respiration in seeds of, A., 651.  
 vitamin-B<sub>1</sub> and -B<sub>2</sub> in, A., 310.  
 measurements of suction forces in, A., 784.  
 rust diseases of, A., 890.  
 destruction of weeds in, B., 318.  
 nutritive value of, A., 423; B., 398.



- Cereals**, production of foods and feeding-stuffs from, (P.), B., 575.  
 application of variance analysis in chemistry of, B., 747.  
 determination in, of moisture, electrically, (P.), B., 734.
- Cereal products**, treatment of, preparatory to baking, (P.), B., 446.  
 determination in, of proteins, B., 621.  
 of starch, B., 127.  
 of water, apparatus for, (P.), B., 292.
- Cerebrospinal fluid**, bromide in, A., 89.  
 inorganic constituents of, A., 636.  
 organic acids of, in paralysis, A., 1057.  
 reaction of mastic with, A., 1055.  
 biological properties of, A., 1291.  
 determination in, of proteins, A., 185.
- "Cerere."** See *Tricresol mercuriacetate*.
- Cerium**, ionised, spectrum of, A., 440.  
 Raman spectra of, A., 552.  
 crystal structure of, A., 1192.
- Cerium thorium borides**, A., 348.  
 chloride, magnetic susceptibility of, A., 448.  
 magnetic rotation of solutions of, A., 900.  
 iodate, effect of electrolytes on solubility of, A., 1198.  
 nitrate, thermal decomposition of, in carbon dioxide, A., 132.  
 magnesium nitrate, paramagnetic rotation of, A., 448.  
 oxide sols, coagulation of, A., 1202.
- Ceric sulphate**, use of, in potentiometric titration, A., 34.
- Cetoleic acid**, *p*-bromo-, *p*-chloro-, and *p*-phenyl-phenacyl esters, A., 946.
- Cetraria islandica**, fumaric acid from, A., 889.
- Cetyl alcohol**, production of, (P.), B., 474.  
 heat of combustion of, A., 229.
- Cetyl iodide**, equilibrium of, with octadecyl iodide, A., 468.  
*p*-nitrophenylurethane, A., 1232.
- $\alpha$ -Cetylacetonedicarboxylic acid**, ethyl ester, and its copper derivative, A., 499.
- Chabazite**, adsorption by, A., 17.
- Chalcopyrite**, crystal structure of, A., 682.
- Chalk**, alkalinity of, B., 598.
- Chalkones**. See *Phenyl styryl ketones*.
- Chamotte**, treatment of, for glass-melting crucibles, furnace linings, etc., (P.), B., 1032.
- Charcoal**, activation of, (P.), B., 1017.  
 effect of ash of coke on activity of, B., 326.  
 adsorption by, of chlorine and carbonyl chloride, B., 706.  
 of dyes, A., 908.  
 charged with nitrogen, of electrolytes, A., 458.  
 of weak electrolytes, A., 803.  
 of hydrogen, A., 568, 687.  
 of methyl-violet from solution, A., 1199.  
 of organic solvents, A., 992.  
 of phosgene and chlorine, in gas masks, B., 1010.  
 of sugars, A., 1199.  
 desorption from, for low temperature attainment, A., 332.  
 sedimentational hysteresis of suspensions of, in solutions of dyes, A., 19.  
 colloidal properties of, A., 570, 806.  
 swelling of, A., 1199.  
 combustion of, B., 709.  
 portable kilns for burning of, (P.), B., 669.  
 antioxygenic action in extinction of burning of, B., 710.  
 action of, on heavy metal salts in solution, A., 992.
- Charcoal**, active, A., 118, 803, 1199.  
 structure of, A., 113.  
 production of, (P.), B., 490.  
 production and testing of, B., 927.  
 adsorption by, from solutions containing two organic acids, A., 332.  
 of carbon disulphide, at low pressures, A., 223.  
 relation between gas content and, A., 16.  
 anomalous, A., 991.  
 specific, A., 16.  
 adsorption and decomposition of nitrous oxide by, A., 1199.  
 action of ozone on, A., 16.  
 use of, in manuring of plants, B., 277.  
 granulated, regeneration of, (P.), B., 1066.
- animal**, adsorption with, A., 1084.  
 refining of sugar with, B., 1099.  
 decolorisation of sugar solutions with, B., 910.
- beechwood**, spontaneous inflammability of dust from, B., 919.
- bone**, determination in, of calcium sulphate and insoluble matter, B., 1015.
- platinised**, adsorption of, A., 568.  
 sugar, adsorption of monobasic aliphatic acids by, A., 223.  
 hydrogenation of, B., 919.
- wood**, adsorption of gases on, A., 223.  
 identification of fragments of, B., 229.
- Philippine wood**, adsorption by, A., 458.
- Chaulmoogric acid**, in oil of *Carpotroche brasiliensis*, B., 686.
- salts**, and their solubilities, A., 511.  
 manufacture of derivatives of, (P.), B., 128.  
 and its dihydro-derivative, Curtius reaction with, A., 375.
- p*-Chaulmoogrylamidoazobenzene**, A., 375.
- iso*Chavibetol**, production of, (P.), B., 138.
- Cheese**, X-ray examination of, B., 1134.  
 ripening or curing of, (P.), B., 1007.  
 spreading quality of, B., 574.  
 melted, water in, B., 366.  
 butter fat in, B., 445.  
 varieties of, B., 701.  
 control of, in Denmark, B., 700.
- American Cheddar**, calcium retention on diet containing, A., 1060.
- Cheddar**, oxidation-reduction potentials of, during ripening, B., 1052.
- crustless**, production of, (P.), B., 959.
- Emmenthal**, degradation of protein and fusibility of, B., 239.
- foil-wrapped**, deterioration of, B., 621.
- Kingston**, nitrogen distribution in ripening of, B., 1052.
- processed**, B., 321, 1052.
- Stilton**, volatile acids of, B., 526.
- Swiss**, influence of bacterial growth and acid production on draining of, in presses, B., 911.  
 analysis of, in relation to its standardisation, B., 481.
- detection in**, of salicylic acid, *p*-hydroxybenzoates, benzoic acid, and *p*-chlorobenzoic acid, B., 1134.  
 of tin solder causing dark discoloration, B., 284.
- Cheiranthin**, toxicity of, A., 541.
- Cheiranthus cheiri***, cardiac glucosides of, A., 541.
- Chelidamic acid**, diiodo-, manufacture of, (P.), B., 671.  
 3:5-diiodo-, and its derivatives, A., 622.
- Chelidamic acids**, diiodo-, *N*-alkyl derivatives of, (P.), B., 817.
- Chemicals**, crystallographic identification of, A., 709.
- Chemical apparatus**, corrosion-testing of materials for, B., 942.  
 combination, A., 10.  
 compounds. See under *Compounds*.  
 constants, significance of, A., 220.  
 engineering. See under *Engineering*.  
 industry, automatic control in, B., 707.  
 automatic operation of valves in, B., 707.  
 mechanical handling in, B., 371.  
 drying in, B., 707.  
 electric furnaces for, B., 991.  
 elimination of noise in, B., 1.  
 safety in, B., 531.  
 high chromium steels in, B., 346.  
 plant. See under *Plant*.  
 processes, merging of stages in, B., 291.  
 non-adiabatic, A., 324.  
 reactions. See under *Reactions*.  
 warfare. See under *Warfare*.  
 works, plant for removal of fumes in, B., 1011.
- Chemiluminescence**, A., 446.
- Chemotherapy**, A., 1047, 1263.  
 in relation to periodic classification, A., 90.
- Cherries**, control of case bearer in, B., 442.
- Cherry gum**, composition of, A., 202.
- Cherry-laurel water**, effect of copper on Pecker's reaction with, B., 816.  
 distilled, reduction of molybdates by, in Pecker's reaction, B., 816.
- Chessylite**, structure of, A., 682.
- Chestnut trees**, Chinese, grown in United States, tannin in, B., 852.
- Chewing-gum**, manufacture of, (P.), B., 47.  
 manufacture of base for, (P.), B., 1007.
- Chicks**, avitaminosis-A in, A., 972.  
 control of caecal coccidiosis in, B., 1048.  
 effect of irradiated ergosterol on, A., 773.  
 fatty acids of fat of, B., 269.  
 paralysis of nutritive origin in, A., 783.  
 protein requirements of, A., 299, 771.  
 embryo, respiration and metabolism of, A., 419.  
 growing, calcium and phosphorus requirements of, A., 539, 646, 773.  
 protein content of rations for, A., 643.
- Chicle**, manufacture of substitute for, (P.), B., 689.
- Children**, retention ratio calcium-phosphorus in, A., 773.  
 pre-school, iron requirement of, A., 1060.
- China**, bone, placing materials for, B., 548.  
 durability of, B., 229.
- China clay**. See under *Clay*.
- Chinese**, metabolism of, A., 643.
- Chitin**, hydrolysis of, by hydrochloric acid, A., 371.
- Chitotriose undecacetate**, A., 371.
- Chloral**, condensation of, with carbamide and phenylcarbamide, A., 151.  
 anaesthetic action of, A., 88.
- Chloral hydrate**, condensation of, with *p*-nitrophenylhydrazine and acetic acid, A., 932.  
 fate of, in the organism, A., 1285.
- Chloramine-T**, action of, on disulphides containing S-S linking, A., 1017.  
 use of, in analysis, A., 825, 1009.
- Chlorates**. See under *Chlorine*.
- Chlorides**. See under *Chlorine*.
- Chlorin e**, derivatives of, A., 626.
- $\psi$ -Chlorin p6**, and its esters, A., 1264.
- Chlorins**, and their derivatives, A., 1264.

**Chlorine**, nuclear factors for, A., 439.  
 isotopes of, A., 1075.  
 separation of, A., 1186.  
 preparation of, for treatment of colds, etc., (P.), B., 80, 161.  
 manufacture of, by Deacon's process, A., 918.  
 electrolytic cell for, (P.), B., 732.  
 fine structure and isotope displacements in spectrum of, A., 207.  
 quadruplets in spectra of nitrogen, oxygen, sulphur, and, A., 315.  
 action of light on mixtures of, with ozone, A., 348.  
 scattering of X-rays by, A., 892.  
 emission of glowing platinum in, A., 1072.  
 liquid, use of, in preparation of bleaching liquors, B., 178.  
 entropy of, and its equilibrium with water, A., 997.  
 adsorption of, by charcoal in gas masks, B., 706, 1010.  
 equilibrium of, with hydrogen at high temperatures, A., 695.  
 kinetics of oxidation of oxalic acid by, A., 702.  
 photochemical reaction of, with benzene, A., 349.  
 reaction of, with solid carbonates, A., 349.  
 with hydrogen, A., 237, 1000.  
 with ozone, A., 815.  
 decomposition of mixtures of ozone and, in carbon tetrachloride solution, A., 25.  
 hydrate, A., 585.  
 content of, in gastric juice, A., 1055.  
 active, production of, (P.), B., 63.  
 determination of, B., 641.  
**Chlorine monoxide**, spectrum and photochemical decomposition of, A., 237.  
 dioxide, absorption spectrum of, A., 211.  
 infra-red absorption spectrum of, A., 1075.  
 and its solutions, photodecomposition of, A., 581.  
 heptoxide, vapour pressure of, A., 906.  
 oxides, infra-red absorption spectra of, A., 558.  
**Hydrochloric acid**, photochemical formation of, A., 130, 348.  
 synthesis of, A., 1101.  
 manufacture of, (P.), B., 340, 505, 1078.  
 furnace for, (P.), B., 980.  
 from magnesium chloride, B., 61, 144.  
 solid, band spectrum of, A., 1075.  
 transference numbers of aqueous solutions of, A., 914.  
 dielectric polarisation of, in solution, A., 322.  
 heat of formation of, A., 1206.  
 heat capacity of aqueous solutions of, A., 696.  
 freezing points of mixtures of sulphur monochloride and, A., 228.  
 vapour pressure of, in glacial acetic acid, A., 339.  
 adsorption of, by hide, A., 122.  
 Debye-Hückel theory applied to dilute solutions of, A., 467.  
 equilibrium of, with methyl alcohol, methyl nitrite, and nitrosyl chloride, A., 808.  
 with oxygen, A., 21.  
 oxidation of, by hydrogen peroxide, A., 703.  
 by nitric acid, A., 702.  
 gaseous, catalytic addition of, to acetylene and to vinyl chloride, A., 819.  
 non-metals resistant to, B., 1077.  
 analysis of, A., 587.

**Chlorine** :—  
**Hydrochloric acid**, standardisation of, with solid sodium thiosulphate, A., 921.  
 detection and determination of, in presence of hydrobromic acid, A., 1102.  
 determination of, with the immersion refractometer, A., 1009.  
 in presence of hydrobromic acid, A., 824.  
**Chlorides**, Raman spectra of, A., 108.  
 ultra-violet absorption spectra of aqueous solutions of, A., 107.  
 non-replacement of, by iodides in deficiency, A., 426.  
 anhydrous, electrolysis of, (P.), B., 898.  
 detection of, colorimetrically, A., 824.  
 in presence of bromides, A., 486.  
 in presence of cyanides, A., 1220.  
 determination of, argentometrically, A., 921.  
 electrometrically, A., 353.  
 iodometrically, A., 1182.  
 volumetrically, A., 241.  
 in presence of bromides, A., 921.  
 in dairy products and biological material, B., 284.  
 in white sugar, B., 1099.  
**Chlorates**, manufacture of explosives from, (P.), B., 753.  
 use of, as weed-killers, B., 618.  
 analysis of, volumetrically, A., 1102.  
 determination of, colorimetrically, A., 33.  
 in nitrates, B., 840.  
**Perchloric acid**, and its salts, Raman effect for, A., 1075.  
 conductivity of, A., 575.  
 as an oxidising agent, A., 1219.  
 indicators for mixtures of sulphuric acid with, A., 921.  
 and its salts, determination of, A., 241.  
**Perchlorates**, detection of, in explosives, B., 752.  
 micro-determination of, A., 1220.  
**Hypochlorites**, production of concentrated solutions of, B., 381.  
 stability of solutions of, B., 798.  
 deterioration of, B., 382.  
 determination of strength of solutions of, (P.), B., 62.  
 determination in, of alkalinity and carbon dioxide, B., 545.  
 of "available chlorine," apparatus for, B., 1077.  
**Chlorine determination** :—  
 determination of, A., 486.  
 acidimetrically, A., 631.  
 colorimetrically, with benzidine, A., 243.  
 in biological media, A., 1056.  
 in organic compounds, A., 410, 529.  
 in organic substances, A., 709, 1149.  
 determination of  $p_H$  of solutions containing, B., 1028.  
**Chlorite**, orientation of crystals on, A., 326.  
 of corundum rocks, A., 248.  
**Chloroanil**. See *p*-Benzoquinone, *tetra*-chloro-.  
**Chloroantimonates**. See under Antimony.  
**Chlorocruorin**, oxygen affinity of, A., 955, 1151.  
**Chlorodiborane**, A., 350.  
**Chloroform**, manufacture of, (P.), B., 1071.  
 extraction apparatus for, A., 828; B., 817.  
 magnetic susceptibility of mixtures of, with acetone, A., 1083.  
 ebullioscopy with, A., 804.  
 photochemical decomposition of, A., 349.  
 fluorine derivatives of, A., 513.

**Chloroform**, distribution of, in blood, A., 424.  
 effect of, on hen's eggs, A., 646.  
 anaesthetic, detection of decomposition products in, B., 160.  
 narcotic, production of, from benzidine, B., 785.  
**Chlorogenic acid**, constitution of, A., 850.  
 in coffee, B., 46.  
 effect of steam-treatment on, B., 1053.  
**Chlorohydrins**, manufacture of, from olefines, (P.), B., 973.  
**Chloro-hydrocarbons**, stability of, B., 300, 1113.  
**Chlorophenol-red**, dissociation constant of, in potassium chloride solutions, A., 809.  
**Chlorophyll**, A., 625, 756, 1045, 1263.  
 constitution of, A., 1266.  
 allomerisation of, A., 756.  
 optical properties of, A., 286.  
 hydrogenation of, catalytically, A., 1266.  
 formation of, in roots exposed to light, A., 660.  
 effect of temperature on, in etiolated seedlings, A., 435.  
 biological degradation of, A., 659.  
 effect of, on formation of haemoglobin, A., 1151.  
**Chlorophyll-a** and **-b**, constitution of, and their derivatives, A., 1265, 1266.  
 absorption spectra of, A., 435.  
**Chlorophyll-b**, structure of, A., 174.  
**Chlorophyll series**, A., 174.  
**Chloropicrin**, preparation of, A., 142.  
 photolysis of, in aqueous solution, A., 1215.  
 control of nematodes with, B., 813.  
 detection of, A., 362, 928.  
**Chloroporphyrins**. See under Porphyrins.  
**Chloroprene**. See *Δ*-Butadiene,  $\beta$ -chloro-.  
**Chlororaphin**, A., 1043.  
**Chlorosulphinic acids**, esters, relative mobility of radicals in, A., 719.  
**Chlorosulphonic acid**, anisyl and phenyl esters, A., 729.  
**4-Chlorosulphonylphenyl-2-hydroxy-1-naphthyl sulphide**, and its derivatives, A., 735.  
**4-Chlorosulphonylphenyl-2-hydroxy-1-naphthylsulphone**, and its anilide, A., 735.  
**Chocolate**, food product from milk and, (P.), B., 321.  
 diabetic and milk, manufacture of, B., 399.  
 eating, unsaponifiable value of fat from, B., 29.  
 milk, determination in, of dry milk constituents, B., 784.  
 containing vitamins, preparation of, (P.), B., 127.  
 determination in, of lecithin, B., 749.  
 of santonin, B., 482.  
 extraction and determination of vanillin in, B., 239.  
**Chocolate products**, detection of lecithin in, B., 575.  
 chocolate truffles, examination of, B., 46.  
**Choladienic acid**, dihydroxy-, A., 615.  
*c*-Choladienic acid, A., 1029.  
**Cholanic acid**, structure of, A., 849.  
 and hydroxy-, and its acetyl derivative, A., 397.  
**Cholanic acid**, 12-hydroxy-, A., 1131.  
*tetra*hydroxy-, A., 615.  
**Cholebilirubin**, A., 1155.  
**Choleic acid**, reaction of, with ethyl acetate, A., 366.  
**Choleic acids**, A., 930, 944.  
**Cholenic acid**, A., 397.  
**Cholenic acid**, 3:7-dihydroxy-, oxidation of, and its oxide, A., 615.  
**Cholestene**, 4:4-dichloro-, and its bromo-derivative, A., 381.

- Cholesterol**, hydroxy-, in wool fat, A., 639.  
**Cholestenone**, structure of, A., 746.  
 acids from, A., 1131.  
**Cholesterol**, constitution of, A., 54, 381, 510, 1131, 1245.  
 and its bromo-derivatives, and *di-cyano*-, A., 944.  
 solubility of, in mixed solvents, A., 991.  
 in solutions of bile salts, A., 1275.  
 crystal structure of, A., 327, 381.  
 and its ester, colloidal condition of, A., 632, 844.  
 capillary activity of dispersions of lecithin with, A., 911.  
 effect of, on diffusion of acids and alkalis in gels, A., 1203.  
 catalytic properties of, A., 632.  
 bromination of, A., 54.  
 dehydrogenation of, A., 944.  
 reaction of, with phosphorus pentachloride, A., 381.  
 with silver and cuprous chlorides, and with *o*-cresol, A., 510.  
 soluble compounds of, with soaps, A., 1127.  
 esters, A., 381.  
 and its derivatives, antigenic properties of, A., 869.  
 content of, in blood, A., 956.  
 in blood in health and disease, A., 296.  
 in blood of pregnant rats and those with tumours, A., 959.  
 in cellular oxidation in relation to mental disease, A., 960.  
 in gall-bladder, A., 534.  
 density of, from human gall-stones, A., 960.  
 fate of, in the human intestine, A., 85, 1058, 1059.  
 destruction of, in the organism, A., 1058.  
 content of, in normal and malignant tissues, A., 187.  
 irradiated, A., 381, 1070.  
 determination of, colorimetrically, A., 510.  
 nephelometrically, A., 666.  
 polarimetrically, with ergosterol and zymosterol, A., 955.  
 in bile, A., 1055.  
 in blood, A., 75, 868.  
 apparatus for, A., 1272.  
 in blood-serum, A., 75.  
 in blood-serum and -plasma, A., 636.  
 and its esters, in muscle, A., 765.  
 in tissues, A., 187.  
*iso*Cholesterol, A., 267.  
*iso*Cholesterols, A., 54.  
 $\beta$ -Cholesterol, A., 844.  
**Cholesteryl ethers**, A., 737.  
*p*-nitrophenylurethane, A., 1232.  
 triphenyl methyl ether, A., 255.  
**Cholic acid**, constitution of, A., 849.  
 and its derivatives, solvent power and surface tension, of A., 334.  
 dehydrogenation of, A., 944.  
 determination of, in bile, A., 871.  
*apo*Cholic acid, constitution of, A., 849.  
 $\beta$ -Cholic acid, formation of, by ultra-violet irradiation of cholic acid, and its methyl ester, A., 615.  
**Choline**, occurrence and detection of, in coffee, B., 701.  
 csters, A., 1061.  
 derivatives, production of, (P.), B., 785, 1104.  
 pharmacological action of, A., 648, 1284.  
 determination of, in animal tissues, A., 765.  
 in plants, A., 1179.  
 in tobacco, A., 976.
- Chollepidanic acid**, constitution of, A., 1248.  
*iso*Chondodendrine, constitution of, A., 1047.  
**Chondroitin-sulphuric acid**, coacervation of gelatin and, A., 466.  
**Chromanone-5:7-di- $\beta$ -thiopropionic acid**, thio-, A., 1259.  
**Chromanoquinoline derivatives**, A., 175.  
**Chrome alum**, mordanting of silk with, B., 1026.  
**Chrome ores**, crystal structure of, A., 1192.  
**Chrome yellow**, manufacture of colouring matters containing, (P.), B., 234.  
 paint technology of, B., 561.  
**Chromioxalic acid**, ammonium red, electrolysis of, A., 1097.  
**Chromite**, briquetting of concentrates of, B., 265.  
 recovery of chromium from, B., 180.  
 oxidation of, A., 584.  
 zinc-bearing, A., 1107.  
**Chromium**, production of, (P.), B., 557.  
 effect of, on cast iron, B., 1033.  
*K X-ray* absorption spectrum of, A., 3.  
 radiation from, on electronic bombardment, A., 1184.  
 electrochemistry of, A., 478.  
 passivity of, A., 473.  
 electrodeposition of, A., 473, 1097; B., 606, 1085; (P.), B., 151, 352, 1088.  
 theory of, B., 1085.  
 from trivalent chromium salt solutions, B., 150, 893.  
 free from cracks and pores, B., 986.  
 anodes for, (P.), B., 115.  
 on light metals, B., 430.  
 defective electrolytic deposits of, B., 729.  
 determination of thickness of electrodeposits of, B., 774, 893.  
 electroplating with, B., 150, 349; (P.), B., 685, 896.  
 apparatus for, (P.), B., 991.  
 baths for, (P.), B., 513.  
 cold bath for, B., 942, 1122.  
 control in baths for, B., 845.  
 determination of sulphuric acid in baths for, B., 942.  
 chromium anodes for, B., 1085.  
 lead and lead-antimony anodes for, B., 109.  
 protection against corrosion by, B., 470.  
 of iron, (P.), B., 310.  
 of iron or steel, (P.), B., 1124.  
 of light alloys, B., 511.  
 of tools, B., 845; (P.), B., 943.  
 of tools and gauges, B., 1085.  
 of wire, (P.), B., 28.  
 magnetic properties of, in solid solution, A., 679.  
 evaporation of, A., 828.  
 equilibria of, with carbon and with carbon and iron, A., 117.  
 electrolytic, hardness of, B., 1122.  
 porosity of, B., 66.  
**Chromium alloys**, with aluminium and iron, heat-resistant, (P.), B., 847.  
 with cobalt and iron, B., 1035.  
 with ferronickel, treatment of, (P.), B., 609.  
 with iron, A., 221; B., 469.  
 production of, (P.), B., 802.  
 carbon-free, production of, B., 1035.  
 corrosion-resistant, (P.), B., 388.  
 malleable, manufacture of, (P.), B., 67.  
 with iron and nickel, B., 509.  
 increasing strength of, (P.), B., 231.  
 cast, tensile properties of, B., 1083.  
 with nickel, with interpenetrating lattice, A., 15.  
 for electric resistances, B., 986; (P.), B., 112.
- Chromium alloys**, with nickel and iron, thermal expansion of, B., 309.  
 with tantalum and molybdenum, manufacture of, (P.), B., 989.  
 with tungsten and molybdenum, (P.), B., 68.  
**Chromium bases**, hydrated, absorption spectra of, A., 1074.  
**Triaquotrichlorochromium**, preparation of, A., 239.  
**Chromium salts**, reactions of violet solutions of, A., 352, 708.  
 physico-chemical properties of sulphite complexes of, A., 1087.  
 complex, adsorption of, B., 905.  
**Chromium halides**, A., 133, 229.  
 iodides, A., 133.  
*monoxide*, band spectrum of, A., 557.  
*sesquioxide*, catalytic properties of, A., 1095.  
 reduction of, B., 1035.  
 fused products of silica and, A., 124.  
**Chromic salts**, aggregation in solutions of, A., 809.  
 detection of, in violet solutions, A., 712.  
**Chromic arsenate sols**, coagulation of, A., 1202.  
 chloride, production of, (P.), B., 383.  
 and its hexahydrates, paramagnetic susceptibility of, A., 112, 1191.  
 chlorides, hydrated, A., 239.  
 hydroxide, A., 585.  
 gels, ageing of, A., 123.  
 hydrosols, coagulation of, A., 571.  
 oxidation of, A., 584.  
 precipitation of, in easily filtered form, A., 244.  
 oxide, band spectrum of, A., 1187.  
 formation of spinel from zinc oxide and, A., 801.  
 sulphate, separation and determination of green and violet forms of, A., 827.  
 and sodium chromic sulphate, equilibria of green and violet forms of, A., 996.  
**Chromous iodide**, preparation of, and reaction with hydrogen, A., 133.  
**Chromic acid**, A., 133.  
**Chromates**, manufacture of, (P.), B., 260.  
 ultra-violet absorption spectra of, A., 673.  
 action of hydrogen sulphide on, A., 133.  
 effect of, on passivity of metals, A., 1093.  
 determination of, potentiometrically, A., 712.  
**Dichromic acid**, photochemical reaction of, with quinine, A., 480.  
**Dichromates**, manufacture of, (P.), B., 260, 599.  
 as standard in iodometry, A., 487.  
 titration with, A., 924.  
**Perochromic acid**, blue, constitution of, A., 708.  
**Chromium detection and determination** :—  
 detection of, A., 244.  
 colorimetrically, A., 590.  
 spectroscopically, A., 1224.  
 determination of, electrometrically, in presence of vanadium, B., 149.  
 in iron alloys, rustless steels and ferrochromium, B., 149.  
 iodometrically, in presence of manganese, A., 491.  
 spectroscopically, in steel, B., 891.  
 in chromium-nickel steel, B., 65.  
 in presence of vanadium and manganese, A., 36.

Chromium ions, magnetism of, in violet nitrate solutions, A., 993.  
 Chromium phosphors. See under Phosphors.  
 Chromones, synthesis of, A., 279, 519, 520, 621, 1257.  
 Chromophores, parallelism between colour and reactivity of, A., 365.  
 Chromosantonin, refractive indices of, A., 214.  
 Chromotropic acid azodiphenylmethylpyrazole, A., 169.  
 Chronaxie, A., 424.  
 Chrysazin. See Anthraquinone, 1:8-dihydroxy-.  
 Chrysene, hydrogenation of, A., 730.  
 Chrysin, hydroxy-, identity of, with 5:7:8-trihydroxyflavone, A., 620.  
 Chrysocolla, production of porous silica catalyst from, (P.), B., 886.  
 Chrysophanic acid, salts, A., 1035.  
 synthesis of anthrone derivatives of, A., 164.  
 colour reactions of, B., 863.  
*Chrysothamnus nauseosus*, oil of, A., 888.  
 Cider, acetaldehyde in distillates from, B., 655.  
 removal of alcohol from, (P.), B., 620.  
 Cigarettes, mouthpiece material for, (P.), B., 624.  
 Cigarette paper. See under Paper.  
 Cigarette smoke, nicotine in, B., 1136.  
*Cimex lectularius* and *rotundatus*, difference in action of ethylene oxide on, B., 318.  
 Cinchona, tinctures of, B., 206.  
 Cinchona alkaloids, A., 289, 865.  
 stereochemistry of, A., 759.  
 steric rearrangement of, A., 289.  
 soluble preparations of, (P.), B., 368.  
 determination of, iodometrically, B., 576.  
 Cinchona bark, acetone extract from, B., 206.  
 Cinchona ketones, reduction of, to alcohols, A., 289.  
 Cinchonine acid, derivatives of, A., 403.  
 microchemistry of medicinal derivatives of, B., 448.  
 Cinchonidine, rotation of, and its dihydrobromide, A., 760.  
*epi*Cinchonidine, and its dianisoyl-*d*-tartrate, A., 290.  
 Cinchonine, rotation of, and its dihydrobromide, A., 760.  
*epi*Cinchonine, and its dianisoyl-*d*-tartrate, A., 290.  
 Cinchophen, action of, on liver tract, A., 641.  
 uric acid excretory action of, A., 647.  
 Cineole, in French lavender oil, B., 1104.  
 determination of, in essential oils, B., 161.  
 Cinnamaldehyde, fate of, in the body, A., 86.  
 Cinnamaldehydes,  $\beta$ -bromo-, and their derivatives, A., 271.  
 Cinnamanisidides, A., 387.  
 Cinnamic acid, preparation of, A., 853; B., 12.  
 photobromination of, A., 821.  
 addition of bromine to, in acetic acid, A., 475.  
 dialkylaminomethyl esters, A., 845.  
 ethyl ester, reaction of, with ammonia, methylamine and diethylamine, A., 1246.  
 $\beta$ -(ethylbutylamino)ethyl ester, hydrochloride of, A., 846.  
 detection of, in wines, B., 281.  
 Cinnamic acid, 2:6-dichloro- and 2-chloro-6-fluoro, A., 55.  
 $m$ -fluoro-, A., 1247.  
*cis*-Cinnamic acid, nuclei of, A., 612, 1029.  
 metastable modifications of, A., 738.

Cinnamic acids, substituted, addition of bromine to, A., 55.  
 $\alpha$ -aminofluoro-, benzoyl derivatives, A., 1129.  
 nitro-,  $p$ -bromophenacyl esters, A., 1249.  
 Cinnamic-( $m$ -nitrobenzylidenehippuric acid),  $m$ -nitro- $\alpha$ -amino-, benzoyl derivative, A., 69.  
 Cinnamon, examination of, B., 285.  
 determination of alcoholic extract of, B., 48.  
 Cinnamonitriles,  $\beta$ -bromo-, A., 271.  
 Cinnamostyrylamide, A., 387.  
 9-Cinnamoyl-2:3:4:11-tetrahydrocarbazole, 10:11-dihydroxy-, A., 168.  
 Cinnamyl arsenite, A., 937.  
 bromide, action of, on magnesium ethyl bromide, A., 41.  
 chloride, action of magnesium on, A., 730.  
 Cinnamylideneacetic acid, preparation of, A., 55.  
 Cinnamylideneacetophenone, 2-hydroxy-, A., 520.  
 2-Cinnamylideneacetyl- $\alpha$ -naphthol, A., 520.  
 Cinnamylidenebisdi-indone, A., 1252.  
 Cinnamylidenemalononic acid, decolorised, A., 614.  
 Cinnamylxyacetetaldehyde, and its derivatives, A., 384.  
*O*-Cinnamylangonolactone, A., 748.  
 Cinobufagin, A., 397.  
 Circulation apparatus, A., 713.  
*Cirsium oleraceum*, control of, B., 1097.  
 Citraconic acid, ethyl ester, reaction of, with sodium ethoxide, A., 1234.  
 Citraconic acids, *l*-bornyl esters, A., 252.  
 Citral, derivatives of, A., 276.  
 Citric acid, production of, by fermentation, A., 1169; B., 859.  
 by moulds, A., 93, 1168.  
 dehydration temperature of, A., 253.  
 ammonium salt, solubility of phosphates in, B., 101.  
 ammonium and bismuth salts, determination of bismuth in solutions of, B., 1119.  
 calcium salt, determination in, of citric acid, B., 884.  
 magnesium salt,  $p_H$  changes in solutions of, A., 338.  
 determination of, iodometrically, A., 43.  
 by Kogan's method, A., 144.  
 in milk, B., 861.  
 in tobacco, B., 703.  
 Citric essences, analysis and adulteration of, B., 1008.  
*Citromyces glaber*, citric fermentation by, A., 882.  
 Citron peel, brining and candying of, B., 1163.  
 Citronella oil, analysis of, B., 751.  
 Citronellol, Raman spectrum of, and its isomerism with rhodinol, A., 897.  
 Citronin, A., 662.  
 Citrulline, formation of, from arginine by bacteria, A., 196.  
 in the body, A., 962.  
 Citrus, fertilisers for, B., 568.  
 potash as, B., 317.  
 prevention of green mould in fruit of, by use of ammonia and ammonium salts, B., 202.  
 effect of hydrocyanic acid fumigation on respiration of, B., 523.  
 effect of phosphoric acid on, B., 617.  
 production of concentrates of fruit of, (P.), B., 446.  
 products from fruit of, (P.), B., 240.  
 recovery of essential oil from fruits of, (P.), B., 449.

*Citrus*, quick-freezing of juices of, B., 79.  
 mottle-leaf and other diseases of, A., 977.  
*Citrus limon*, citronin from, A., 662.  
*Cladophora*, protein crystals in, A., 101.  
*Cladosporium fulvum*, control of, by fungicides and fumigants, B., 74.  
 Clarkeite, A., 38.  
 Clay or Clays, B., 771.  
 nature of, A., 495.  
 treatment of, to overcome drying effects, B., 104.  
 to prevent efflorescence of bricks, etc., (P.), B., 105.  
 effect of grog on pressure transmission in dry-pressing of, B., 182.  
 device for producing a curve co-ordinating shrinkage and drying loss of bars of, B., 306.  
 clutiation and dressing of, B., 1079.  
 liquitation of, by alkali, B., 305.  
 sintering of, for artificial concrete, (P.), B., 184.  
 colouring of, (P.), B., 1080.  
 plasticity of, B., 887.  
 physico-chemical properties of, B., 1031.  
 physical and mechanical properties of, B., 147.  
 electrolytes in, A., 230.  
 degree of dispersion of, and effect of cations thereon, B., 360.  
 adsorption of gases by, in relation to their surface, B., 1002.  
 swelling of, under pressure, A., 806.  
 effect of  $p_H$  of sedimentation medium on orthokinetic type of coagulation of, B., 36.  
 suspensions, dilute, theory of coagulation of, A., 226.  
 production of bricks, tiles, etc., from, (P.), B., 938.  
 for construction of chemical plant, B., 627.  
 for glass-melting pots, B., 982.  
 influence of bedrock on amounts of plant nutrients in, B., 617.  
 absorbent, manufacture of, (P.), B., 146, 506.  
 re-activation of, (P.), B., 325.  
 bleaching, Russian, for fatty oils, B., 560.  
 Burley, estimation of alumina in, from silica content, B., 305.  
 ceramic, effect of mechanical pressure on imbibitional and drying properties of, B., 1079.  
 Tennessee, colloids in, B., 507.  
 china, drying of, (P.), B., 641.  
 Clarion, of Vinton County, Ohio, B., 1031.  
 colloidal, physical properties of, A., 806.  
 concentration of cations in, A., 465.  
 Danish, gel formation and thixotropy of, A., 20.  
 decolorising, preparations of, (P.), B., 1029.  
 revivification of, (P.), B., 93.  
 diaspore, shrinkage of, B., 342.  
 from Illinois coal-beds, A., 1230.  
 Indiana, particle-size of, A., 1200.  
 Japanese, hygroscopic equilibria in, B., 403.  
 acid, B., 228.  
 adsorption of dyes from aqueous solution by, A., 332.  
 colour reaction of, with carotene in palm oil, B., 474.  
 kaolinite, hydraulic properties of, B., 507.  
 plastic, jollying and jiggering of, in the batting machine, B., 228.  
 potter's, filter presses for, (P.), B., 629.  
 reactivated, restoration of moisture and addition of acid to, (P.), B., 547.

- Clay or Clays, saggar, life of, B., 181, 306.  
 sedimentary, classification of, A., 926.  
 low-vitrifying, salt-glazing of, B., 306.  
 testing of, with the pachimeter, B., 867.  
 determination of, in soils, B., 780.  
 determination of total surface area of, B., 743, 811.  
 determination in, of aluminium oxides, B., 466.
- Clay bodies, proportioning of grain size in, B., 182.  
 thermal-shock effect on transverse strength of, B., 182.  
 resistance of, to action of steam, B., 23.  
 testing of, B., 342.  
 products, effect of de-airing on strength of, in wet state, B., 548.  
 flashing of, (P.), B., 147.  
 structural, use of natural gas in firing of, B., 548.  
 slurries, hydraulic losses in pumping of, B., 983.  
 ware, drying of, B., 24.  
 effect of firing on soluble sulphate in, B., 342.  
 reversible expansion of, B., 887.  
 fired, thermal expansion of, B., 228.
- Cleaning compositions, containing rubber latex, (P.), B., 30.
- Cleansing agents, manufacture of, (P.), B., 13, 121, 173, 252, 332, 415, 495, 671, 792, 832, 973, 995, 1020, 1071, 1114.  
 for fabrics, (P.), B., 539.  
 for toilet use, (P.), B., 658.
- Clematis*, saponins in, A., 665.
- Cleveite, actinium-uranium ratio in, A., 715.
- Clinoptilolite, A., 1228.
- Clostridium acetobutylicum*, formation of methylglyoxal by, A., 968.
- Cloth, drying apparatus for webs of, (P.), B., 675.  
 draw sheet for use in dyeing, scouring, bleaching, etc., of, (P.), B., 769.  
 shrinking of, (P.), B., 883.  
 shrinking machine for finishing of, (P.), B., 504.  
 varnished, dielectric properties of, B., 610.  
 waste, carbonisation of, (P.), B., 837.  
 clothes, washed, drying of, B., 60.
- Clover, effect of culture of, on soils, A., 549.  
 effect of gypsum on, B., 744.  
 influence of soil reaction and manuring on composition of mixtures of grass and, B., 1047.  
 bur, effect of exposure to sunlight and rain on digestibility of, B., 286.  
 perennial, manuring of, B., 568.  
 red, sensitivity of, to boron and manganese, B., 200.  
 white, chemical composition of, B., 953.  
 effect of nitrogenous fertilisers on, B., 953.
- Clupanodonic acid, methyl ester, hydrogenation of, A., 252.
- Clupea ilisha*, oil of, B., 899.
- Clupein, A., 524, 954, 1269.
- Coaervation, complex, A., 571, 693, 807.
- Coagulation, A., 336.  
 influence of  $\pi_{11}$  on protection and sensitisation in, A., 183.  
 at boundary surfaces, A., 119.  
 of colloids. See under Colloids.  
 of electrolytes, effect of non-electrolytes on, A., 462.  
 reversible, in living tissues, A., 88, 191, 192, 425.  
 slow, of sols, A., 336.
- Coal, B., 455.  
 origin of, A., 1016; B., 245, 917.  
 formation of, A., 360.  
 classification of, B., 965.  
 classification and nomenclature of, B., 632.  
 petrography and classification of, B., 533.  
 composition of, B., 6, 298.  
 constituents of, A., 716.  
 chemical constitution of, B., 6.  
 chemical constitution and action of chlorine on, B., 407.  
 production of, in Great Britain, B., 6.  
 treatment of, (P.), B., 135.  
 treatment of, with solvents, (P.), B., 8, 537.  
 extraction of, with high-boiling organic compounds, B., 664.  
 heat treatment of, (P.), B., 489.  
 swelling and caking processes in, B., 245.  
 cleaning of, B., 708, 757, 1109; (P.), B., 88, 485.  
 theory of, B., 582.  
 dry cleaning of, in England, B., 582.  
 pneumatic process for, B., 582.  
 washing of, (P.), B., 170.  
 apparatus for, (P.), B., 3, 217.  
 slurry from, B., 1109.  
 washer-boxes for, (P.), B., 1069.  
 washed, classification and dewatering of, (P.), B., 1019.  
 towers for draining of, (P.), B., 325.  
 separators for, (P.), B., 1012.  
 pneumatic separators for, (P.), B., 791.  
 removal of dust from, (P.), B., 53.  
 on vibrating screens, (P.), B., 971.  
 separation of shale and, (P.), B., 827.  
 desulphurisation of, during carbonisation, B., 1110.  
 machines for breaking of, (P.), B., 492.  
 crushing apparatus for, (P.), B., 212.  
 dressing of, (P.), B., 172.  
 dressing or grading of, (P.), B., 247.  
 grading of, (P.), B., 372, 580.  
 apparatus for grinding of, (P.), B., 916.  
 fine grinding of, (P.), B., 405.  
 pulverisers for, (P.), B., 244.  
 wet separating tank for, (P.), B., 85.  
 sorting of, (P.), B., 585.  
 apparatus for sorting and separation of, (P.), B., 756.  
 blending of, for carbonisation, B., 133.  
 for manufacture of coke, B., 758.  
 evaluation and blending of, for coke manufacture, B., 374.  
 apparatus for feeding or charging of, (P.), B., 455.  
 spontaneous combustion of, B., 487, 664, 757, 966, 1013.  
 distribution of sulphur in combustion of, B., 630, 966.  
 determination of calorific value of, B., 166, 294.  
 nomogram for calculation of calorific value of, from its analysis, B., 166.  
 determination of heat of combustion and calorific value of, B., 87.  
 measurement of contraction and expansion of, on heating, B., 374.  
 caking of, B., 871.  
 determination of caking properties of, B., 455, 487.  
 carbonisation of, (P.), B., 294, 457, 827, 873, 921.  
 at the Fuel Research Station, B., 758.  
 Leicestershire (L. & N.) Coal Distillation Co.'s plant for, at Newbold, B., 166.  
 apparatus for, (P.), B., 711, 761.  
 coke dischargers for retorts for, (P.), B., 669.
- Coal, carbonisation of, position of gas off-take in, B., 294.  
 in gases, B., 871.  
 in vertical retorts, B., 632.  
 with production of fuel gas, (P.), B., 761.  
 by-products from, (P.), B., 921.  
 treatment of ammonia liquors from, (P.), B., 711.  
 recovery of ammonium salts and phenols from waste liquors from, (P.), B., 587.  
 conversion of sulphur compounds during, B., 871.  
 low-temperature, (P.), B., 170.  
 multi-stage apparatus for, (P.), B., 711.  
 light spirits from, B., 214.  
 influence of inorganic constituents on carbonisation and gasification of, B., 52.  
 carbonisation and chemical utilisation of, B., 245.  
 coking of, B., 295.  
 influence of bitumen on, B., 294.  
 effect of oxidation on, B., 294.  
 heat of coking of, and heat expenditure in coke ovens, B., 789.  
 relation of caking indices and agglutinating values of, to its coking properties, B., 583.  
 tests on, in relation to coking properties and by-product yields, B., 1062.  
 Bochum crucible for coking test on, B., 534.  
 calculation of coke yield from, B., 295.  
 distillation of, (P.), B., 537, 667, 711.  
 apparatus for, (P.), B., 921, 1066.  
 in rotary retorts, B., 534.  
 under pressure and in hydrogen, B., 87.  
 destructive, (P.), B., 536.  
 low-temperature, (P.), B., 170.  
 distillation and briquetting of, (P.), B., 667.  
 distillation and gasification of, (P.), B., 667.  
 gasification of, in intermittent vertical chambers, B., 296.  
 in vertical retorts, B., 583.  
 with oxygen at low temperatures, B., 407.  
 influence of removal of ash from, on yield of gas and coke, B., 757.  
 influence of constituents of, on gas produced therefrom, B., 167.  
 hydrogenation of, B., 52, 456, 870; (P.), B., 55.  
 catalytic high-pressure hydrogenation of, B., 295, 967.  
 destructive hydrogenation of, (P.), B., 217.  
 briquetting of, (P.), B., 170.  
 properties of, in relation to its origin, B., 757.  
 specific gravity of, B., 487.  
 colloidal dispersion of, B., 294.  
 agglutinating power of, B., 709.  
 colouring of, (P.), B., 666.  
 relative oxidisability of constituents of, B., 1109.  
 metamorphosis of, A., 1230.  
 bacteria of, A., 360, 1067.  
 action of bacteria on, A., 307, 1107.  
 action of chlorine on, B., 708.  
 gases enclosed in, B., 664.  
 occurrence of germanium in, A., 39.  
 action of hydrogen on, B., 214.  
 occurrence of iodine in, A., 249.  
 mineral oils and petroleum from, B., 376.  
 tar and oils from, B., 216.

- Coal, water in, B., 534.  
 effect of chemical nature of, on formation of explosive gases in mines, B., 533.  
 amalgamation of hydrocarbon oils and, (P.), B., 457.  
 conditions for firing of rotary kilns with, B., 52.  
 fluxing of ashes and slags from, in furnaces, B., 1110.  
 storage of, B., 757.  
 utilisation of, B., 1062.  
 use of, in melting and heating of metals, B., 1122.  
 manufacture of fuels from, (P.), B., 1112.  
 abatement of smoke from, B., 824.  
 fertilising action of, B., 567.  
 sampling of, from wagons, B., 374.  
 automatic, (P.), B., 378.  
 sampling and analysis of, B., 664.  
 analysis of, B., 51, 630, 869.  
 petrographic analysis of, B., 244.  
 media for float-and-sink tests on, B., 869.  
 evaluation of, from its "rational analysis," B., 630.  
 as a fuel, B., 918.  
 determination in, of iodine, A., 241.  
 of nitrogen, B., 326, 630, 708, 823, 870.  
 of phosphorus, B., 582.  
 of sulphur, B., 51, 214, 582, 870.  
 of total sulphur by Hackl and Eschka methods, B., 534.  
 of alkali-soluble ulmins, B., 966.  
 of water, B., 165, 403, 966.
- Coal, American, hydrogenation of, B., 824.  
 spores of, B., 1109.  
 Argentine, gasification of, for use in gas engines, B., 216.  
 artificial, production of, A., 1230.  
 carbonisation of, B., 245.  
 Assam, sulphur in, B., 582.  
 bituminous, microstructure of, B., 582.  
 formation of, B., 918.  
 coking and swelling of, B., 374.  
 bacteria of, A., 360.  
 quartz in, A., 1016.  
 formation of substance similar to, B., 1063.  
 "artificial," B., 6.  
 finely-ground, extraction and low-temperature carbonisation of, B., 1063.  
 bright, B., 663.  
 British, classification of, B., 1062.  
 brown, "berginisation" of, B., 167.  
 removal of phenols from water of distillation of, B., 216.  
 briquetting of, B., 820.  
 rôle of humic acids in, B., 966.  
 resins of, B., 1014.  
 transformation of, into bituminous coal, A., 597.  
 fertilising action of, B., 74.  
 fertilisers from, B., 618.  
 Rhenish, production of semi-coke from briquettes of, B., 871.  
 brown and mineral, polymeride-bitumens of, A., 665.  
 Canadian, low-temperature carbonisation of, by the Illingworth process, B., 583.  
 coking, production of, (P.), B., 1066.  
 petrography of, B., 965.  
 properties of, B., 294.  
 influence of oven width on carbonisation of, B., 709.  
 pressures in plastic layer of, during carbonisation, B., 1110.  
 determination of swelling pressure of, with Agde's apparatus, B., 374.  
 degasification of, B., 1063.
- Coal, coking, influence of heat and oxidation on properties of, B., 823.  
 oxidation of, during storage, B., 870.  
 effect of degree of fineness on analysis and physical properties of, B., 583.  
 testing of, B., 1014.  
 Canadian, caking indices of, B., 583.  
 fine, briquetting of, (P.), B., 873.  
 apparatus for burning of, (P.), B., 666.  
 washed, drying of, and manufacture of agglomerates, B., 918.  
 fossil, autoxidation of, B., 789.  
 Fushun, liquefaction of, by Bergius process, B., 246, 408.  
 high-ash, determination of calorific value of, B., 869.  
 high-volatile, conversion of, into low-volatile coal, (P.), B., 1066.  
 Southern American, for metallurgy, B., 1013.  
 Illinois, under-clays of, A., 1230.  
 Indian, action of solvents on, B., 757.  
 Lisichanski, coking of, B., 88.  
 Moscow, production of aluminium chloride from ash of, B., 1028.  
 New Zealand, low-temperature carbonisation of, B., 871.  
 utilisation of, B., 823.  
 Northumberland and Durham, B., 823.  
 Pittsburgh, coking properties of, B., 871.  
 effect of fine inerts on agglutinating power of, B., 166.  
 pulverised, combustion of, B., 921, 1110.  
 valves for, (P.), B., 93.  
 testing of, B., 583.  
 Rumanian, manufacture of metallurgical coke from, B., 758.  
 South African, determination of forms of sulphur in, B., 166.  
 South Brazilian, B., 487.  
 sulphurous, coking of, B., 6.  
 swelling, carbonisation of, B., 374.  
 tertiary, extraction of, with tetralin, B., 1014.  
 Transvaal, washing, blending, and carbonisation of, B., 1014.  
 solvent extraction of, B., 918.  
 Upper Silesian, oxidation of, B., 919.  
 Waikato, preparation of translucent sections of, A., 714.  
 from Yorkshire, Nottinghamshire, and Derbyshire coalfields, B., 214.
- Coal ash, fusion of, B., 583.  
 determination of fusion point of, in Remmey oxy-acetylene furnace, B., 1063.  
 comparative softening and melting point determinations on, B., 1110.  
 detection of, in air, B., 915.  
 briquettes. See under Briquettes.  
 dust, separators for, (P.), B., 629.  
 combustion of, B., 246, 325.  
 ignition and combustion in engines burning, B., 824.  
 relation between combustion products and ignition point of, B., 1063.  
 explosions of, in underground tunnels and its elimination in mines, B., 133.  
 gas. See under Gas.  
 industry, in the United Kingdom, B., 167.  
 products, manufacture of, (P.), B., 217.  
 seams, B., 487.  
 production of, A., 39.  
 slurry, treatment of, B., 534.  
 sieving of, (P.), B., 669.  
 removal of water from, by filtration, B., 534.  
 tar. See under Tar.
- Coating compositions, (P.), B., 31, 118, 235, 901, 902, 997, 1041.  
 manufacture of, (P.), B., 118, 234, 272, 474, 518, 737, 948, 998.  
 from cellulose acetate or nitrate, (P.), B., 948.  
 from synthetic resins, (P.), B., 808, 1092.  
 from waxes, (P.), B., 118.  
 development of, B., 736.  
 for aeroplanes, B., 314.  
 for automobiles, B., 315.  
 for fabrics, (P.), B., 235.  
 for fibrous materials, (P.), B., 1041.  
 for metals, etc., (P.), B., 614.  
 for porous and non-porous surfaces, (P.), B., 315.  
 for oil containers, etc., (P.), B., 436.  
 for pipe-lines, cables, etc., (P.), B., 1041.  
 antifouling, (P.), B., 1041.  
 anti-rust, (P.), B., 475.  
 cellulose derivative, (P.), B., 31, 235.  
 of low inflammability, containing cellulose derivatives, (P.), B., 901.  
 cellulose ester, (P.), B., 475.  
 nitrocellulose, (P.), B., 901.  
 manufacture of, (P.), B., 687.  
 increasing durability of, (P.), B., 1091.  
 non-livering, (P.), B., 901.  
 containing drying oils, (P.), B., 31.  
 ornamental, manufacture of, (P.), B., 1041.  
 polyvinyl-drying oil, production of, (P.), B., 778.  
 protective, (P.), B., 778.  
 quick-drying, (P.), B., 687.  
 containing synthetic resins, B., 562.  
 sheet, (P.), B., 1041.  
 waterproof, from drying oils, (P.), B., 807.
- Cobaltatoms, magnetic behaviour of, A., 112.  
 allotropic transformation of, A., 1193.  
 transformation of, B., 1084.  
 recovery of, from speiss, (P.), B., 472.  
 cementation of, with silicon, B., 1083.  
 infra-red arc spectra of, A., 1188.  
 K X-ray absorption spectrum of, A., 3.  
 photo-electric and thermionic emission from, A., 105.  
 and its alloys, magnetic properties of, A., 795.  
 magnetic multiplets of, A., 1191.  
 quadrivalent, magnetic moment of, A., 112.  
 antioxygenic properties of, A., 476.  
 in plant ash, A., 549.  
 powdered, manufacture of, from its carbonyl, (P.), B., 310.
- Cobalt alloys with aluminium, A., 685.  
 with carbon, shrinkage of, on solidification, B., 109.  
 with carbon and iron, A., 1090.  
 with chromium and iron, B., 1035.  
 with iron, hardening of, B., 940.  
 with iron and molybdenum, A., 801.  
 with iron and nickel, (P.), B., 310.  
 with iron and tungsten, A., 456.  
 with molybdenum, treatment of, (P.), B., 472.  
 with tungsten carbide, manufacture of, (P.), B., 68, 1088.
- Cobalt bases (*cobaltamines*), constitution of, A., 984.  
 complex molybdates and tungstates of, A., 1219.  
 Cobaltic aquopentammine octoborate decahydrate, salts of, A., 485.  
 Dihydroxotetramminocobaltic hydroxide and its derivatives, A., 585.  
 Dodecamminehexoltetracobaltic thiosulphate, A., 709.

**Cobalt bases:—**

- Hexamminetrisdicobaltic chloride, A., 709.
- Persulphatopentamminocobaltic sulphate, A., 1219.
- Cobalt compounds, bivalent, magnetic properties of, A., 1191.
- colorimetric reaction for, A., 182.
- Cobalt salts, action of hypophosphite on, A., 134.
- Cobalt chloride, magnetic properties of, in solution, A., 120, 985.
- magnetic study of colour changes of, A., 1083.
- effect of heat on colour of pyridine solutions of, A., 319.
- anodic oxidation of, A., 237.
- compounds of, with lithium chloride, A., 811.
- fluoborates, A., 583.
- potassium nitrites, A., 483.
- sulphate, transference number of, A., 698.
- anhydrous, magnetic properties and crystalline structure of, A., 114.
- solubility of, A., 125.
- heptahydrate, Curie and Weiss constants for, A., 1191.
- equilibrium of, with cupric sulphate and water, A., 811.
- sulphides, crystal structure of, A., 326.
- Cobaltous hydroxide, colour change of, from blue to rose, A., 485.
- nitrate, hexahydrate, equilibrium of, with cupric nitrate hexahydrate, A., 1198.
- Cobalt organic compounds:—
- Cobalt carbonyls, and their derivatives, A., 920.
- nitrosyl tricarbonyl, constitution and properties of, A., 239.
- triethylenediamines, configuration of, A., 239.
- Cobalt detection, determination, and separation:—
- detection of, with antipyrine, A., 36.
- determination of, electrolytically, A., 712.
- in presence of nickel, A., 923.
- permanganometrically, A., 590.
- by dinitroresorcinol, A., 1224.
- using zinc oxide, A., 137.
- in organic substances, A., 922.
- in steel, B., 728.
- and its separation from nickel, A., 1012.
- determination and separation of, as nitroso- $\beta$ -naphthol compound, A., 1224.
- Cobalt ions, equilibrium of, with nickel ions, A., 700.
- Cobalt ores containing silver in the Kongsberg district, A., 38.
- Coca leaves, determination of alkaloids in, B., 206, 1054.
- Cocaine, sensitisation and desensitisation of amines by, A., 540.
- transformations of, A., 758.
- substitutes for, B., 448.
- toxicology of, A., 774.
- detection of, micro-chemically, A., 1150.
- in mixtures with substitutes, B., 79.
- in presence of novocaine, with cobalt thiocyanate, B., 206.
- detection in, of novocaine, B., 785.
- d-d*-Cocaino tartrates, crystal structure of, A., 451.
- Coccarboxylase, A., 305, 967.
- Cocculus, alkaloids of, A., 1048.
- Coccus viridis*, concentrations of hydrocyanic acid to kill, B., 813.
- Cochineal, colouring matter of, B., 1135.
- Cockroaches, control of, with essential oils, B., 1105.

- Cocksfoot, fatty acids from, A., 662.
- phosphatides of, A., 1179.
- wax constituents of, A., 204.
- Cocoa, filter plates for pot-presses for, (P.), B., 481.
- food product from sugar, water, and, (P.), B., 321.
- powder, pneumatic separator for, (P.), B., 132.
- Coconuts, and their products, B., 697.
- removal of plant nutrients in cultivation of, B., 856.
- green manuring of, B., 319.
- storage of, after harvesting, B., 313.
- by-products from, B., 441.
- toddy, original solids in, B., 1102.
- Coccoimmunogen, preparation of, (P.), B., 818.
- Codeine, and its isomerides, pharmacology of, A., 965.
- synergised drugs from, (P.), B., 1056.
- benzylchloride, A., 952.
- detection of, A., 178.
- detection in, of morphine, B., 960.
- Codling moths. See under Moths.
- Cod-liver oil, production of, (P.), B., 686, 1090.
- free fatty acids and vitamin-D in, A., 1294.
- iodine in, A., 1280.
- unsaponifiable matter of, A., 636.
- vitamins in, A., 782.
- vitamin-A and -D content of, A., 886.
- stability of vitamins-A and -D in, A., 309.
- vitamin potency of, B., 560.
- vitamin reactions of, A., 973.
- manufacture of stable emulsions of, (P.), B., 1040.
- effect of, on milk production, A., 1155.
- fresh and rancid, iodine value and refractive index of, B., 686.
- detection of, colorimetrically, B., 116.
- with antimony trichloride, B., 648.
- detection of vitamin-A in emulsions of, B., 736.
- determination in, of vitamin-A, A., 97, 1293.
- determination of oil in emulsions of, B., 240.
- determination of oil and fat-soluble vitamins in emulsions of, B., 152, 355, 391, 735.
- Cod-liver meal, vitamin value of, A., 201.
- Co-enzyme action, A., 1064, 1287.
- Coeranthrene series, syntheses in, A., 274.
- Coeranthrene(7')-2-carboxylic acid, A., 274.
- heteroCoerdianthrone, and 5':5"-dichloro-, A., 617.
- heteroCoerdianthr-7':7"-one-3':5':3':5"-tetracarboxylic acid, and its salts, A., 732.
- Coffee, fermentation of, B., 321.
- absorption spectrum of, B., 1134.
- "depoisoned" infusions of, B., 160.
- block preparations of, (P.), B., 785.
- poisoning by cadmium in, B., 46.
- removal of caffeine from, (P.), B., 447.
- effect of steam treatment on chlorogenic acid in, B., 1053.
- role of decomposition products of chlorogenic acid in maturing of, B., 366.
- occurrence and detection of choline in, B., 701.
- free from caffeine, manufacture of, (P.), B., 240.
- natural and treated, free caffeic acid and chlorogenic acid in, B., 46.
- raw, production of trigonelline from, B., 367.
- determination in, of caffeine, B., 205, 367.

- Coffee beans, A., 975.
- fat and wax from, B., 312.
- Coffee bean oil, A., 975.
- Coffee extracts, determination in, of caffeine, B., 205, 1103.
- Coffee plants, effect of potassium-nitrogen ratio on growth of, A., 204.
- green manuring of, B., 278.
- Cohesion, A., 452.
- Coke, production of, (P.), B., 489, 585, 758, 921, 970.
- in chamber ovens, (P.), B., 921, 922.
- in horizontal chamber ovens, (P.), B., 489.
- regenerative chamber ovens for, (P.), B., 667.
- from carbonaceous fuels, (P.), B., 761.
- evaluation and blending of coal for, B., 374, 758.
- from pitch, (P.), B., 490.
- with simultaneous production of petrol, light oils, etc., (P.), B., 711.
- and gas, in intermittently operated ovens, (P.), B., 873.
- and water-gas, in vertical chamber ovens, (P.), B., 170.
- formula for theoretical recovery of, B., 6.
- machines for breaking of, (P.), B., 492.
- crushing apparatus for, (P.), B., 212.
- apparatus for crushing and screening of, (P.), B., 661.
- apparatus for dry extinction of, (P.), B., 172.
- quenching of, with dilute ammoniacal liquor, B., 487.
- apparatus for handling of, (P.), B., 54.
- determination of strength of buttons of, from caking-power tests, with Agde's apparatus, B., 374.
- determination of "heat of re-coking" of, B., 374.
- combustion of, B., 709.
- in central heaters, B., 295.
- ignition and combustion properties of, B., 870.
- reactivity of, B., 6.
- reactivity, graphitisation, and electrical conductivity of, B., 535.
- use of, domestically, B., 295.
- in melting and heating of metals, B., 1122.
- cyanised, production of, (P.), B., 633.
- Donetz, combustibility of, B., 824.
- ignited, extinguishing of, (P.), B., 248.
- low-temperature, apparatus for production of, (P.), B., 1017.
- use of, in producers, B., 295.
- lump, formation of, B., 295.
- metallurgical, manufacture of, (P.), B., 54, 376.
- from Rumanian coal, B., 758.
- ore, production of, (P.), B., 191.
- peat, use of, in blast furnaces, B., 385.
- petroleum, B., 666.
- pitch, B., 246.
- semi-, manufacture of, (P.), B., 170.
- from Rhenish brown-coal briquettes, B., 871.
- influence of catalysts and of reduced pressure on equilibrium of generator-gas and, B., 1015.
- small, use of, in gasworks, B., 487.
- Upper Silesian, treatment of, B., 534, 966.
- testing of, B., 1014.
- shatter test for, B., 51.
- evaluation of, B., 374.
- determination in, of nitrogen, B., 708, 823, 870.
- of phosphorus, B., 582, 709.
- of sulphur, B., 51, 582.



**Coke ovens**, (P.), B., 88, 221, 409, 489, 585, 828, 874, 921, 969, 1065.  
 anchoring devices for, (P.), B., 93.  
 apparatus for charging of, (P.), B., 927.  
 trucks for charging of, (P.), B., 55.  
 compression of charge of coal in, (P.), B., 93.  
 closure of, (P.), B., 378.  
 device for closing hydraulic mains of, (P.), B., 459.  
 control of, B., 6.  
 dip pipes for, (P.), B., 636.  
 discharge of, (P.), B., 11.  
 doors for, (P.), B., 93, 414.  
 fuels for, B., 921.  
 heating of, (P.), B., 137, 170.  
 total heat expenditure in, B., 789.  
 coke-pushing machines for, (P.), B., 221.  
 silica bricks for, B., 842.  
 turbine blowers used with, B., 824.  
 turbo-compressors for use with, B., 298.  
 Feld washers for, B., 632.  
 path of travel of gases in, B., 214.  
 application of Haber-Löwe gas interferometer in, B., 918.  
 recovery of gases from, (P.), B., 761.  
 recovery of cyanogen from gas from, B., 420.  
 efficiency of, B., 824.  
 determination of thermal efficiency of, B., 824.  
 poisoning of stock by lead in herbage and soils adjacent to, B., 743.  
 chamber, (P.), B., 633.  
 apparatus from drawing off gases from, (P.), B., 711.  
 horizontal regenerative, (P.), B., 298.  
 twin-flue, (P.), B., 874.  
 horizontal, (P.), B., 791.  
 regenerative, (P.), B., 54, 135, 409, 633.  
 retort, (P.), B., 8, 633, 827, 873.  
 cooling of, (P.), B., 89.  
 removal of coke from, (P.), B., 715.  
 vertical, (P.), B., 711.  
 intermittent, (P.), B., 791.  
 vertical retort, (P.), B., 1066.  
**Colchicine**, determination of, in seed and corm of *Colchicum* and its preparations, B., 1135.  
*Colchicum*, and its preparations, determination in, of colchicine, B., 1135.  
**Colds**, chlorine for treatment of, (P.), B., 80, 161.  
**Colemanite**, use of, as a glaze, B., 23.  
**Collagen**, structure of, B., 740.  
 effect of electrolytes, bating and tanning solutions on, B., 740.  
 properties of fibres of, B., 740.  
 double refraction of fibres of, B., 72.  
 transformation of, by heat, A., 694.  
 swelling of, A., 337, 636.  
 effect of neutral salts on swelling and hydrolysis of, by alkaline solutions, B., 810.  
 isoelectric point of, A., 1202.  
 combination of, with dyes, B., 740.  
 action of proteolytic ferments on, B., 904.  
 action of trypsin on, B., 393.  
**Collisions**, involving interactions, A., 107.  
**Collision membranes**. See under Membranes.  
**Colloids**, nomenclature of, A., 691.  
 determination of molecular weight of, A., 462.  
 dielectric constant, polarisation and dipole moment in, A., 462, 692.  
 application of measurements of dielectric ions to, A., 692.  
 effect of electrolytes on fixation of dyes by, A., 693.

**Colloids**, Lambert-Beer law for, A., 570.  
 crystallopolymorphic theory of, A., 911.  
 effect of low temperature on, A., 462.  
 anomalous viscosity of, A., 121.  
 rigidity of, A., 1086.  
 diffusion of, A., 18.  
 osmotic pressure of, A., 540.  
 action of diuretics on, A., 301.  
 suspension effect in, A., 225.  
 water relations in, A., 335.  
 coagulation of, A., 805.  
 by electrolytes, A., 19, 571, 1087.  
 mutual coagulation of, A., 463.  
 influence of charge on sedimentation of, A., 806.  
 triangular co-ordinates for, A., 19, 692.  
 chemistry of, A., 120.  
 reactions between, A., 227, 996.  
 biophysical chemistry of, A., 808.  
 parenteral resorption of, A., 426.  
 aerosol, light scattering in, A., 909.  
 charged, diffusion of, A., 18.  
 inorganic, electrokinetics and base-exchange capacity of, A., 459.  
 lyophilic, A., 465, 571, 806, 995, 1087.  
 cryolysis of, A., 337, 1086.  
 numerical fixation of, A., 692.  
 molecular, constitution of, A., 18.  
 plant. See under Plants.  
 polar, molecular weight of, A., 1201.  
 protein, refractivity of, A., 226.  
 unstable, velocity of coagulation of, A., 692.  
**Colloid mills**, (P.), B., 132.  
**Colloidal electrolytes**. See under Electrolytes.  
 gels, extinction coefficients in formation of, A., 1202.  
 rhythmic phenomena in, A., 571.  
 hydrophilic, measurement of deformation of, A., 806.  
 thixotropic, electro-rheic effect of, A., 995.  
 effect of ultrasonic waves on, A., 911.  
 hydrosols, stability of, A., 19.  
 sensitisation and stabilisation of, A., 463.  
 particles, structure of, A., 1085, 1201.  
 radii of, A., 909.  
 determination of size of, from viscosity, A., 18.  
 dielectric properties of, A., 793.  
 diffusion of, A., 805.  
 powders. See under Powders.  
 sols, preparation and properties of, A., 1086.  
 coagulation of, by electrolytes, A., 994.  
 by organic compounds, A., 122.  
 kinetics of, A., 1202.  
 relation between coagulation and gelation of, A., 805.  
 colourless, optics of, A., 993.  
 hydrophilic, effect of salts on viscosity of, A., 805.  
 coacervation of, with dyes, A., 1203.  
 solutions, constitution of, A., 122.  
 extension double refraction of, A., 1201.  
 polarisation of light diffused by, A., 18.  
 dielectric constant of, A., 462.  
 solvation equilibrium in, A., 225, 570, 910.  
 flocculation of, A., 226, 336.  
 action of light on, A., 910.  
 effect of fluorescent substances on, A., 571.  
 rate of oxidation of, A., 1002.  
 rejuvenation of, A., 226.  
 state, A., 1201.

**Colloidal suspensions**, production of, (P.), B., 916.  
 distribution of particles in, A., 1200.  
 viscosity of, A., 121.  
 variation of suspension effect in, A., 121.  
 systems, alternating current effects on, A., 336.  
 thixotropic, dielectric constants of, A., 572.  
 "Colloïde de bœuf," A., 413.  
**Colophony (rosin)**, production of, (P.), B., 235.  
 purification of, (P.), B., 235.  
 refining of, (P.), B., 31.  
 treatment of, (P.), B., 235.  
 raising of melting point of, B., 996.  
 vapour pressure of mixtures of terebenthene and, B., 851.  
 viscosity-temperature relationships of, B., 314.  
 effect of temperature of preparation of, on its ability to absorb oxygen, B., 31.  
 degradation of, due to heating in air, B., 71.  
 glyceryl esters of, B., 997.  
 manufacture of conversion products of, (P.), B., 737.  
 in rubber and reclaimed rubber, B., 119.  
 turpentine in various grades of, B., 117.  
 Philippine, from *Pinus insularis*, B., 562.  
 Russian, B., 154.  
 Spanish, B., 649.  
 wood, physical properties of, B., 314.  
 detection of, B., 71, 687.  
 in linseed oil, B., 647.  
 determination of, in paper, B., 674.  
**Colorimeters** for use with disc mixture, A., 37.  
 absolute, A., 1225.  
 trichromatic, A., 924.  
**Colorimetry**, evaluation of measurements in, A., 357.  
 automatic, A., 137.  
 photo-electric, A., 1012.  
 See also under Analysis, colorimetric.  
**Colostrum fat**, B., 434.  
**Colour**, measurement of, A., 245.  
 fixed points in definition of, A., 36.  
 Hellige-Stock-Fonrobert apparatus for comparisons of, B., 778.  
 removal of, from solutions, A., 920.  
**Colours**, grinding mill for, (P.), B., 197.  
 bronze, manufacture of, (P.), B., 154.  
 earth, B., 947.  
 ice-, manufacture of, (P.), B., 15, 222, 332, 1117.  
 coupling components for, (P.), B., 173.  
 ice- and pigment-, manufacture of, (P.), B., 15, 58, 176, 254, 334, 592, 765, 794.  
 from hydroxycarboxylic arylamides, (P.), B., 878.  
 and intermediates therefor, (P.), B., 460.  
 green, manufacture of, (P.), B., 975.  
 near-white, matching of, in the blanco-meter, B., 314.  
 printing, determination of "colouring power" of, B., 1076.  
 manufacture of pastes from, (P.), B., 498.  
**Colouring matters**, bilirubinoid, A., 1266.  
 plant, A., 280, 520, 976, 1256.  
**Colouring matters**. See also :—  
 Bilirubin. Hæmoglobin.  
 Bombichlorin. Lanaurin.  
 Carotene. Monascin.  
 Chlorocruorin. Robinin.  
 Cholebilirubin. Taraxanthin.  
 Cryptohæmin. Urobilinogen.  
 Hæmocyanin. Uteroverdin.

- Columbite**, removal of tin from, (P.), B., 684.
- Colutea arborescens*, B., 287.
- Combustion** of gases with oxygen, use of pressure in, A., 344.
- of waste materials, (P.), B., 633.
- Commutator**, improved, A., 701.
- Compounds**, classification of, A., 1231.
- aliphatic. See Aliphatic compounds.
- aromatic. See Aromatic compounds.
- conjugated, A., 365, 930.
- properties of, A., 141.
- co-ordination, structure of, A., 795.
- complex, A., 902.
- dissociable, melting points of, A., 1194.
- inorganic. See Inorganic compounds.
- luminescent. See Luminescent compounds.
- organic. See Organic compounds.
- spiro-Compounds**, formation and stability of, A., 741.
- Compressibility** of solutions and suspensions, ultrasonic measurement of, A., 335.
- Compressors**, lowest flash points of oils for, B., 376.
- Compton effect**, A., 208.
- Concentration apparatus**, (P.), B., 454, 788.
- for liquids, (P.), B., 212.
- for volatile substances, (P.), B., 486.
- Conchiolin** of shells, A., 532.
- Concrete**, manufacture of, (P.), B., 106, 800.
- apparatus for, (P.), B., 345.
- apparatus for mixing of, (P.), B., 629, 679.
- pressing of, (P.), B., 773.
- manufacture of aggregates for, (P.), B., 106, 183.
- ballast for, B., 384.
- de-aeration of binding agents for use in, (P.), B., 263.
- relation between properties of, B., 183.
- determination of cement ratio for, B., 148.
- economics of, in relation to cement content, B., 842.
- cement-water ratio of, B., 384.
- resistance to compression, density, and water-cement ratio of, B., 308.
- elasticity of, B., 307.
- composition of, in relation to its strength and elasticity, B., 345.
- shear strength of, in joints, B., 937.
- influence of aggregates on strength of, B., 601.
- density and resistance to chemicals of, B., 307.
- protection and curing of, (P.), B., 800.
- weathering resistance of, B., 727.
- coating of, with rubber, (P.), B., 425.
- japanning on, (P.), B., 235.
- waterproofing of, (P.), B., 425.
- compound for, (P.), B., 1082.
- integral and surface waterproofing of, B., 307.
- decomposition of, in water, B., 307.
- effect of acid waters on, B., 507.
- production of slabs or blocks of, (P.), B., 889, 1120.
- production of moulded articles from, (P.), B., 308.
- manufacture of hollow moulded materials from, (P.), B., 1082.
- construction of roads, walls, foundations, etc., of, (P.), B., 679.
- grid structure for construction of roads, etc., from, (P.), B., 1082.
- for walls, etc., (P.), B., 507.
- made with Italian cements, resistance and elasticity of, B., 147.
- made from clinker bound with cement, defects in, B., 642.
- containing trass, B., 773.
- Concrete**, influence of addition of trass on contraction of, B., 773.
- Concrete**, artificial, sintering of clay for, (P.), B., 184.
- cellular, manufacture of, (P.), B., 106.
- composition for production of, (P.), B., 728.
- coloured, production of, (P.), B., 889.
- gypsum, (P.), B., 425.
- hardened, analysis of, B., 344.
- light, (P.), B., 263.
- porous, production of, (P.), B., 550.
- set, analysis of, B., 65.
- determination in, of moisture, (P.), B., 728.
- Concrete pipes**. See under Pipes.
- Concrete tiles**. See under Tiles.
- Condensers**, (P.), B., 324, 788.
- intermittent chlorination of water for, B., 706.
- electrical, (P.), B., 28.
- dielectrics for, (P.), B., 353.
- impregnation of, (P.), B., 1038.
- paper for, (P.), B., 257.
- paper insulation for, (P.), B., 559.
- dry aluminium-electrode, electrolyte for, (P.), B., 514.
- electrolytic, (P.), B., 115, 946.
- alternating-current capacities of, A., 915.
- electrolytes for, (P.), B., 733.
- liquid, (P.), B., 945.
- micro-, A., 246.
- tubular, (P.), B., 1107.
- Confectionery**, crystallisation of, B., 1053.
- Conglutinin**, A., 413.
- Congo red**, detoxification of poisons by, A., 1163.
- Conifers**, fertilisation of seedlings of, B., 362.
- effect of soil reaction on early growth of seedlings of, B., 856.
- chemistry of, A., 852.
- Conine**, optically active, configuration of, A., 865.
- detection of, in anise, B., 448.
- Constants**, graphic methods for calculation of, A., 232.
- Constitution**, chemical, and physical properties, A., 325.
- and absorption spectra, A., 791, 792.
- and *K* X-ray absorption spectra, A., 562.
- Raman effect and, A., 109.
- and rotatory power, A., 276, 857, 1249.
- relation between boiling point and, A., 13, 111, 901, 1194.
- and the parachor, A., 449, 680.
- and colour, A., 1127.
- and odour, A., 1019.
- relation between taste and, A., 425.
- relation of, to action on micro-organisms, A., 95.
- and pharmacological action, A., 963.
- and physiological action, A., 1061, 1166, 1277.
- and trypanocidal activity, A., 69, 180, 408, 1268.
- Convicine**, structure of, A., 755.
- Convulsions**, prevention of, A., 434.
- Cooking**, B., 205.
- chemistry of, B., 784.
- Cooling** of hot gases in pipes, B., 83.
- Cooling apparatus**, (P.), B., 85, 404.
- for loose materials, (P.), B., 1060.
- for oils, etc., (P.), B., 821.
- tower, (P.), B., 212, 628, 756, 964.
- Co-ordination**, A., 112.
- Copal**, treatment of, with cashew-nut shell oil, (P.), B., 900.
- "running" of, B., 517.
- Congo**, preparation of glycerol ester of, B., 392.
- Copal oil**, Congo, A., 1256.
- Copper**, isotopes of, A., 554.
- production of, electrolytically, B., 846; (P.), B., 232.
- electrolytic production and refining of, B., 845.
- extraction of, (P.), B., 190, 351, 1087.
- recovery of, from lead, (P.), B., 1087.
- from slags, (P.), B., 556.
- refining of, (P.), B., 607, 609, 803, 988, 1087.
- and its alloys, (P.), B., 684.
- removal of arsenic in, B., 644.
- electrolytic refining of, B., 1037; (P.), B., 557, 1124.
- starting cathode for, (P.), B., 896.
- using complex salt of cuprous chloride, B., 150.
- recovery of precious metals in, B., 846.
- determination of silver in anode sludge from, B., 310.
- deoxidation of, with calcium zinc, beryllium, barium, strontium, and lithium, B., 844.
- desulphurisation of, (P.), B., 895.
- removal of iron from solutions containing nickel and, (P.), B., 724.
- effect of metals on annealing of, B., 347.
- bright annealing of, B., 892.
- casting of, (P.), B., 388.
- casting of bars of, (P.), B., 803.
- preferred orientation produced by cold-rolling in sheets of, B., 186.
- descaling of, B., 1084.
- poling of, (P.), B., 895.
- roasting of anode slimes of, in Nichols-Herreshoff furnaces, B., 845.
- welding of, B., 553.
- flux and solder for welding of steel and, (P.), B., 894.
- and its alloys with silver, mechanical properties of, B., 265.
- properties of, at high temperatures, B., 940.
- and its alloys, properties of, in relation to low stresses, B., 428, 509.
- absorption spectrum of, A., 3.
- K*-absorption spectrum of, A., 3, 316.
- K* X-ray absorption spectrum of, A., 3.
- arc spectrum of, A., 207, 552, 787.
- scattering of X-rays by, A., 11.
- optical constants of, A., 561.
- electrodeposition of, (P.), B., 351, 473.
- from cyanide solutions, B., 681.
- in presence of gum arabic, A., 1096.
- and its separation from lead, A., 1011.
- adsorption of carbon monoxide and hydrogen by, A., 1199.
- adsorption of gases by, A., 689.
- diffusion of, into gold, A., 454.
- diffusion of zinc in, and its alloys, A., 800, 989.
- diffusion velocity of mixed foil of zinc and, A., 907.
- solubility of, in mercury, A., 457.
- in milk, B., 45.
- solution of, in sulphuric acid, A., 234.
- solubility of silver in, A., 330.
- crystallisation of, at cathodes in electrolysis, A., 917.
- electro-deposition of micro-crystals of, A., 564.
- crystals, diffraction of electrons by, A., 789.
- inner potential of, A., 8.
- solution velocities of different faces of, A., 26.
- mosaic crystals in, A., 903.
- ammonium solutions, catalytic action of, A., 476.

**Copper**, precipitation of, in presence of gum-arabic, A., 1190.  
corrosion of, B., 644.  
by inorganic acids, B., 681.  
open-air, B., 940.  
prevention of, (P.), B., 111.  
protective coating for, (P.), B., 895.  
production of patina on, B., 986.  
nature of adherence of enamels to, B., 23.  
coating of porcelain with, (P.), B., 467.  
plating of shingles with, (P.), B., 190.  
preservatives for wood, fabrics, etc., from, (P.), B., 465.  
in pharmaceutical preparations, B., 1135.  
co-activation of iron and, in chemistry and biology, A., 1182.  
content of, in blood, A., 183.  
annealed, cooling of, (P.), B., 111.  
blister, production of, from its ores, (P.), B., 151.  
cold-worked, annealing of, A., 325.  
electrolytic, metallography of, B., 729.  
strains in, deposited in presence of gelatin, A., 325; B., 431.  
manufacture of ingots of, (P.), B., 68.  
frictional oxidation of, B., 509.  
determination in, of selenium and tellurium, B., 987.  
powdered, manufacture of, (P.), B., 190, 895.  
**Copper alloys**, (P.), B., 943.  
in ancient Egyptian axe-head, B., 1084.  
study of, with the polarising microscope, A., 686.  
manufacture of, (P.), B., 988.  
molten, electrical resistivity of, B., 26.  
resembling gold, (P.), B., 943.  
for fittings in contact with superheated steam, (P.), B., 190.  
with alkaline-earth metals, (P.), B., 310.  
with aluminium, A., 685; B., 605.  
recrystallisation of, A., 989.  
cast, physical properties, thermal analysis and micro-structure of, A., 15.  
with aluminium and iron, A., 907.  
with aluminium and magnesium, A., 989.  
with aluminium and silicon, A., 907.  
with aluminium and zinc, A., 455; (P.), B., 847.  
with cadmium, physical properties of, A., 330.  
with cadmium and zinc, electrodeposition of, from cyanide baths, B., 430.  
with gold, A., 566, 989, 1196.  
mixed crystals of, A., 1095.  
with iron and nickel, (P.), B., 189.  
electrodeposition of, from cyanide solution, B., 66.  
with lead, magnetism and electrical resistance of, A., 1082.  
with mercury and tin, A., 456.  
with mercury and zinc, A., 456.  
with nickel, (P.), B., 350.  
effect of addition of silicon to, A., 907.  
thermo-electric power of, A., 987.  
diffusion and corrosion of, A., 1195.  
age-hardening of, (P.), B., 512.  
with nickel and beryllium, B., 1122.  
with nickel and silicon, A., 907.  
for safety valves, B., 774.  
with nickel and tin, thermal expansion of, B., 149.  
for safety valves, B., 774.  
with nickel, silver, and tin, (P.), B., 111.  
with phosphorus and silver, A., 1196.  
for brazing, (P.), B., 684.  
with silicon, equilibrium of, A., 1082.  
as substitutes for those with tin, B., 644.

**Copper alloys**, with silver, A., 566, 800, 989.  
inverse segregation in, A., 1082.  
fused, internal friction of, A., 117.  
with silver and zinc, A., 687.  
with tin, compounds in, B., 844.  
action of, with lime or quartz in oxygen, A., 350.  
with zinc, A., 566, 801, 990, 1081.  
 $\beta$ -phase in, A., 907.  
determination of volatile constituents in, B., 892.  
**Copper bases** (*cuprammines*), A., 1098.  
**Copper compounds**, structure and magnetic properties of, A., 1191.  
magnetic susceptibility of, A., 324.  
diffusion in alkaline solutions of, A., 121.  
bivalent, colorimetric reaction for, A., 182.  
complex, reactions within, A., 131.  
**Copper salts**, constitution of, in ammoniacal solutions, A., 467.  
effect of, on the organism, A., 73.  
**Copper aluminate**, synthesis of, A., 481.  
carbonates, A., 1098.  
chromate, reduced, as catalyst in reduction of nitro-compounds, A., 819.  
fluoberyllate, A., 583.  
oxides, electrical conductivity of, A., 8.  
sulphide, precipitated, composition of, A., 480.  
sulphides, heat capacities of, A., 328.  
thermal dissociation of, A., 573.  
sulpho-salts, A., 1098.  
**Cupric compounds**, magnetic measurements with, A., 216.  
**Cupric salts**, absorption spectra of solutions of, A., 1188.  
glass electrode titrations of hydroxy-acid complexes of, A., 342.  
**Cupric carbonate**, A., 481.  
chloride, equilibrium of, with lithium chloride and water, A., 697.  
hydroxide, manufacture of, (P.), B., 103.  
nitrate, hexahydrate, equilibrium of, with cobaltous nitrate hexahydrate, A., 1198.  
oxide, dehydration of, A., 238.  
heat of formation of, A., 812.  
sols, coagulation of, in presence of starch, A., 805.  
interaction between neutral salt solutions and, A., 128.  
oxidation of hydrogen, carbon monoxide and paraffin hydrocarbons by, B., 215.  
reduction of, by carbon monoxide and hydrogen, A., 577, 817, 917.  
by hydrogen, A., 475.  
selenate, equilibrium of, in solution, A., 698.  
selenide, sulphide, and telluride, formation of, A., 582.  
sulphate, production of, from copper shot, B., 723.  
magneton number of, A., 901.  
X-ray dispersion by, A., 450.  
production of solutions of, (P.), B., 886.  
equilibrium of, with cobalt sulphate and water, A., 811.  
hydrated, dissociation pressures of, A., 696.  
dehydration of, A., 702.  
pentahydrate, dissociation of, A., 26.  
equilibrium of, with ferrous sulphate heptahydrate, A., 1198.  
ammoniates, A., 350.  
effect of heat on ammonia compounds of, A., 696.  
as an algicide, B., 753.

**Copper**:—  
**Cupric ions**, activity coefficient of, in sulphate solutions, A., 22.  
**Cuprous compounds**, magnetic properties of, A., 1191.  
**Cuprous chloride**, equilibrium of, with oxygen, A., 22.  
autoxidation of, in air, A., 476.  
separation of ammonium chloride and, (P.), B., 465.  
preparation of solutions of, for gas analysis, A., 706.  
iodide, determination in, of iodine, B., 980.  
oxide, manufacture of, B., 145.  
Bequerel effect for, A., 793.  
electrical conductivity of, A., 793.  
conductivity and photo-effect at unidirectional layers of, A., 8.  
reduction of resistance of, (P.), B., 464.  
density of, A., 322.  
peptisation of, A., 705.  
rectifiers. See under Electric rectifiers.  
**Copper organic compounds**:—  
**Copper carbonyl**, A., 481.  
**Copper detection**, determination, and separation:—  
detection of, catalytically, A., 1222.  
by borax bead, A., 1223.  
by means of salicylaldoxime, A., 160.  
by zinc mercuriothiocyanate, A., 1223.  
determination of, A., 589.  
colorimetrically, with piperidinium piperidylthioformate, A., 35.  
with 5-7-dibromo-8-hydroxyquinoline, A., 490.  
electrolytically, A., 590.  
by electrometric titration, A., 243.  
iodometrically, A., 826.  
by Spacu's reaction, A., 1103.  
volumetrically, A., 136, 490.  
in presence of iron, A., 589, 1103.  
in presence of iron and other metals, A., 1011.  
in aluminium, B., 1083.  
in fabrics and rubber materials, B., 503.  
in iron ingots, B., 890.  
in lead, spectroscopically, A., 826.  
in organic substances, A., 922, 1182.  
in water, B., 818.  
in conductivity water, A., 826.  
in sea water, A., 714.  
and separation from aluminium, A., 923.  
and its alloys, determination in, of antimony, B., 801, 1121.  
determination in, of iron, B., 844.  
separation of, from nickel, A., 923.  
**Copper foil**, production of, electrolytically, (P.), B., 557.  
**Copper ores**, flotation of, (P.), B., 556, 895.  
reduction of, (P.), B., 942.  
containing gold and silver, flotation of, (P.), B., 151.  
of Lake Superior, A., 596.  
oxidised, flotation of, (P.), B., 556, 775, 990.  
containing tin, froth flotation of, (P.), B., 231.  
sulphide, recovery of metal from, with ozone, (P.), B., 895.  
flotation of, (P.), B., 775.  
leaching of, (P.), B., 684.  
containing iron and zinc, sulphatising roasting of, (P.), B., 152\*.  
assay of, B., 940.  
**Copper sheets**, soldered and tinned, accelerated weathering tests on, B., 553.

- Copper wire, coating of, with an insulating fluoride layer, (P.), B., 351.  
tinned, rubber-insulated, assay of, B., 644.
- Copperas, formation of cement-like mass in production of, B., 101.
- Copra, deterioration of, B., 856.  
Fiji, treatment of, B., 849.
- Co-precipitation, theory of, A., 457.  
spectrographic study of, A., 243.
- Coprobilirubin, and its derivatives, A., 1045.
- Copromesobiliviolin, A., 864.
- Copronigrin, A., 864.
- Coproporphyrin, action of liver on, A., 85.  
tetramethyl ester, A., 173.  
detection of, in urine, A., 417.
- Coprosterol, fate of, in the human intestine, A., 85.
- Cordierite, garnet and gneiss from Burma, A., 1107.
- Cordite, recovery of solvents in manufacture of, B., 241.
- Cores, foundry, production of, (P.), B., 266.
- Core oils, production of, (P.), B., 649.
- Coriamyrtin, A., 665.
- Coriaria intermedia*, poisonous constituent of, A., 665.
- Cork, manufacture of articles from, (P.), B., 16.
- Cork-board, manufacture of substitute for, (P.), B., 345.
- Corn, field, iodine test for, B., 620.  
See also Maize.
- Corn brandy. See under Brandy.
- Corncockle, detection of, in milling offal, B., 526.
- Cornstalks, manufacture of fibrous material from, (P.), B., 501.
- Corona, spectrum of, A., 441, 787, 788, 1187.
- Coronadite in mangiferous deposits of Morocco, A., 716.
- Coronene, A., 732.
- Coronene-2:3:8:9-tetracarboxylic acid, A., 732.
- Corporin, A., 308.
- Corpus luteum, production of, in male guinea-pigs by ovarian transplants, A., 971.  
hormones of, A., 308, 971.
- Corrosion, A., 816.  
theories of, A., 816.  
distribution of, B., 429.  
topochemistry of, A., 128, 1208.  
rate of, A., 1003.  
constructional materials resistant to, B., 1084.  
material with metallic adhesive resistant to, B., 510.  
testing resistance to, B., 645.  
impingement apparatus for testing of, B., 940.  
bituminous materials for protection against, B., 1040.  
black pigments for protection against, B., 561.  
protection against, by chromium plating, B., 470.  
protection of metals from, (P.), B., 351.  
effect of paints on, B., 117.  
operating cost of, B., 1085.  
of dairy equipment, B., 509.  
of ferrous and non-ferrous metals and alloys, B., 508.  
of metals, A., 27, 1003; B., 644.  
protective paints for prevention of, B., 728.  
in metal scaplanes, B., 348.  
of water pipes, B., 149.  
galvanic, B., 844.
- Cortico-adrenal extracts, oral efficiency of, A., 95.  
effect of, on energy output, A., 432.
- Cortinellus shiitake*, fermentation products of, B., 858.
- Corundum, fused, manufacture of, B., 1031.  
synthetic, surface treatment of articles of, (P.), B., 105.
- Corydalis*, alkaloids of, A., 178.
- Corynanthine, identification of, A., 628.
- Corynebacterium*, production of vitamin-A by, A., 973.
- Corytuberine dimethyl ether, A., 68.
- Cosmetics, German, B., 1135.  
solid, manufacture of, (P.), B., 960.  
detection of magnesium and zinc stearates in, B., 50.
- Cotarnine, synthesis of, A., 843.  
derivatives of, A., 1047.  
detection of, A., 178.
- Cotton, influence of irrigation of soils on yield of, B., 522.  
moisture in, B., 835.  
lye for mercerisation of, (P.), B., 980.  
oil for processing of, B., 1116.  
fading of dyes on, B., 1116.  
printing of. See under Printing.  
adsorption of neutral salts by, A., 20.  
impregnated with sodium hydroxide, oxidation of, by oxygen, B., 794.  
mercerised, faults in, B., 1117.  
increasing lustre of, by dyeing with sulphur dyes, B., 544.  
raw, hygroscopic moisture of, B., 766.  
soluble, non-explosive, non-inflammable, production of, (P.), B., 674.  
determination of water in bales of, B., 566.
- Cotton cloths for tents, oil damage of, B., 418.
- Cotton fabrics, treatment of, prior to roughening or napping, (P.), B., 719.  
dyeing of. See under Dyeing.  
determination of size in, B., 99.
- Cotton fibres, solubility of, in cuprammonium solutions, B., 879.  
catalyst from, A., 1062.  
old and new, distinction between, B., 835.
- Cotton goods, sized and finished, determination of starch in, B., 61.  
determination of size or filling in, B., 61.
- Cotton-leaf hopper, insecticidal dusts for control of, B., 39.
- Cotton plants, production of, under irrigation in the Sudan, B., 855.  
fascine method of irrigation for, B., 1046.  
growing of, with ammonium nitrogen, B., 856.  
boron requirements of, B., 1129.  
fertilisers for, B., 202.  
stimulants for, B., 744.  
effects of irregular distribution of fertilisers on, B., 695.  
effect of nitrogenous fertilisers on, B., 123.  
optimum period of application of nitrogenous fertilisers to, B., 123.  
acid injury to roots of, B., 362.  
treatment of root rot in, with ammonia, B., 479.  
control of boll weevil in, B., 1130.  
field tests in Texas on insecticides for control of bollworm in, B., 277.  
Armenian, inefficiency of fertilisers for, B., 696.
- Cotton yarn, treatment of, to match its colour with that of cuprammonium silk, (P.), B., 19.  
adsorption of leuco-indigotin by, B., 143.  
dyed with sulphur blacks, tendering of, B., 675.
- Cottonseed, and its oil, at various stages of maturity, B., 850.  
destructive distillation of, for power production, B., 631.  
anatomy and microchemistry of, A., 784.  
composition of hemicellulose from hulls of, A., 47.
- Cottonseed meal as food, A., 1161.  
nutritive value of proteins of, A., 189.  
relative nutritive value of proteins of linseed meal and, A., 299.
- Cottonseed oil, changes in, by action of moisture and warming in air, B., 30.  
hydrogenation of, A., 498; B., 805.  
effect of age on Halphen test for, B., 994.
- Couepic acid, structure of, A., 366, 498.
- Coumarin, purification of, (P.), B., 833.  
solubility of, in alcohol and glycerol, A., 615.  
detection of, A., 858.
- Coumarin, 6:7:8-trihydroxy-, and its triacetyl derivative, A., 858.
- Coumarins, synthesis of, A., 279.
- Coumarin-6-azosulpho- $\alpha$ -naphthylarsinic acid, A., 1268.
- Coumarin-3-carboxylic acid, 6-nitro-, A., 528.
- Coumarinic acids, from 1:2- $\beta$ -naphthapyrones, stability of, A., 1038.
- Coumarinyl-3-acetic acid, and its derivatives, A., 519.
- 3-(3'-Coumarinyl)-4-methyl-1:2- $\alpha$ -naphthapyrone, A., 520.
- Coumarone, preparation of, by Krämer and Spilker's method, B., 94.
- Coumarylcarbamic acid, methyl ester, A., 519.
- Covellite, structure of, A., 987.
- Cows, feeding of, on irradiated ergosterol of yeast, A., 1176.  
conversion of carotene into vitamin-A in, A., 657.  
dairy, calcium and phosphorus requirements of, A., 300, 646.  
fish meal as supplemental feeding-stuff for, B., 574.  
fly sprays for, B., 523.  
lactating, mineral requirements of, A., 1161.  
milk, feeding of, with beet leaves, A., 86.  
with palm-kernel and coconut cakes, B., 283.  
acid meadow grass as silage and hay for, A., 86.  
molassed beet pulp as substitute for oats for, B., 320.
- Co-enzyme, chemistry of, A., 305.  
activation of oxido-reduction by, A., 192.
- Crabs, hermit, influence of thiol and sulphoxide groups on growth of, A., 87, 1285.
- Cracking, soaking drum for use in, (P.), B., 539.  
vapour-phase, in the Vickers unit, B., 968.
- Cracking apparatus, Winkler-Koch, B., 1064.
- Cranberries, nutrient requirements and histology of, with special reference to mycorrhiza, B., 201.  
increasing colour of, after removal from the vines, B., 574.  
vitamin-C in, A., 1069.
- Crankshafts, heat-treatment of, (P.), B., 151.
- Crassulaceae*, malic acid formation in, A., 312.  
succulent, oxygen metabolism of, A., 312.
- Cream, production of, (P.), B., 527\*.  
luminescence of, in ultra-violet light, B., 748.

Cream, increasing viscosity of, B., 1133.  
 effect of homogenisation on coagulation and separation of fat from, B., 205.  
 relation of "feathering" and heat-stability of, to fat clumping produced by homogenisation, B., 205.  
 domestic homogenising apparatus for, (P.), B., 482.  
 treatment of, for transport, (P.), B., 1053.  
 apparatus for reconstitution of, (P.), B., 788.  
 deterioration of, by a lipolytic bacterium, B., 911.  
 solid preparations of, (P.), B., 446.  
 artificial, manufacture of, (P.), B., 240.  
 sour, neutralisation and pasteurisation of, B., 621.  
 determination in, of phospholipin, B., 1102.  
 Creameries, biological purification of wastes from, B., 706.  
 Creatine, A., 951, 1041.  
 origin of, A., 422.  
 acetylation of, A., 1041.  
 in meat extract, B., 701.  
 taste deficiency for, A., 192.  
 excretion of, A., 873.  
 physiology and excretion of, A., 422.  
 effect of muscular work on, in human blood, A., 422.  
 determination of, colorimetrically, A., 834.  
 Creatinine, A., 951, 1041.  
 acyl derivatives of, and their salts, A., 951.  
 in meat extract, B., 701.  
 effect of muscular work on, in human blood, A., 422.  
 excretion of, A., 873.  
 in diuresis, A., 535.  
 effect of cholic acid on, under influence of poisons, A., 191.  
 in urine after castration, A., 656.  
 determination of, in diabetic blood, A., 297.  
 Creatinuria, relation of, to muscle-glycogen, A., 83.  
 Creosote, coal-tar, toxicity of, B., 825.  
 Crêpe-de-chine, hand-painting on, (P.), B., 517.  
*o*-Cresol, determination of, in cresylic acid, B., 330.  
*m*-Cresol, benzylation of, A., 611.  
*mono*- and *di*-mercuri-salts of, A., 630.  
 coumarins and 1:4-benzopyrones from, A., 858.  
*m*-Cresol, *mono*- and *di*-bromo-, and their salts, A., 611.  
 6-chloro-2:4-dinitro- and 2:4-dinitro-, derivatives of, A., 734.  
*p*-Cresol, application of Simonis reaction to, A., 620.  
*p*-Cresol, nitro-3-fluoro-, A., 1247.  
 Cresols, production of, from low-temperature tars, (P.), B., 974.  
 gelatinisation of soaps with, A., 911.  
 condensation of, with acetone, A., 842.  
 with ethyl alkylacetoacetates, A., 519.  
 compounds of, with styphnic acid, A., 942.  
 ethers, manufacture of alkyl derivatives of, (P.), B., 974.  
*o*- and *m*-Cresols, determination of, in their mixtures, B., 927.  
*p*-Cresolcarboxylic acid, *o*-amino-, manufacture of, (P.), B., 221.  
 "Cresol-phorones," A., 842.  
 Cresotic acid, cholesteryl ester, and its dibromide, A., 381.

Cresotic acids, condensation of, with butylchloral, A., 848.  
 Cress, hoary, control of, B., 318.  
 Cresylic acid, determination in, of *o*-cresol, B., 330.  
 Crickets, field, black, control of, B., 1105.  
 Cristobalite, crystalstructure of, A., 451, 903.  
 transformation of  $\beta$ -quartz into, A., 1192.  
 inversion of, A., 903.  
 high-temperature form of, A., 564, 903.  
 silicate crystal structures of type of, A., 218.  
 Critical state, history of, A., 139.  
 Crocetin, constitution of, A., 1234.  
 $\alpha$ -Crocetin, extraction of glucoside of, from *Flores verbasci*, A., 501.  
 Crops, drying of, (P.), B., 163.  
 growth of, B., 855.  
 effect of copper sulphate or titanium salts added to fertilisers on, B., 1130.  
 fertilisers for, B., 695.  
 influence of fertilisers on yield of, and on soil reaction, B., 522, 1129.  
 effects of farmyard manure and fertilisers on, B., 782.  
 influence of fluorine on germination and early growth of, B., 1130.  
 effects of applications of soluble nitrogen on yield of, B., 522.  
 effect of legumes in relation to nitrogen economy in production of, B., 39.  
 effect of residual organic matter on yield of, B., 38.  
 effect of paper mulches for soils on yield of, B., 317.  
 effects of stall manures and fertilisers in long-period field trials on, B., 1047.  
 nutrient intake of, B., 1047.  
 use of ammonia- and nitrate-nitrogen by, B., 567.  
 boron in irrigation waters for, B., 317.  
 influence of potash manuring on, B., 567.  
 "effect value" of potassium and phosphorus for, B., 38.  
 effect of sulphur on, B., 567.  
 forage, copper, iodine, iron, manganese, and zinc contents of, A., 1181.  
 root, kainite for control of pests in, B., 318.  
 Croton seed, A., 501, 975.  
 vesicant principle from, A., 665.  
 Crotonaldehyde, composition of, A., 834.  
 production of, (P.), B., 716.  
 condensation products of aniline and, (P.), B., 974.  
 Crotonaldehyde,  $\alpha\beta$ -dichloro-, 2:4:6-tri-bromo- and 2:4:6-trichloro-phenylhydrazones, and their *N*-acetyl derivatives, A., 284.  
 Crotondiethylamide, A., 609.  
 Crotonic acid, ethyl ester, reaction of, with ammonia, methylamine, and diethylamine, A., 600.  
 Crotonic acid,  $\beta$ -amino-, acylation products of, A., 257.  
 Crotonoside, and its picrate, A., 501.  
 structure of, A., 836.  
 Crotyl bromide, allylic rearrangement of, A., 250.  
 Crucibles, impervious, A., 593.  
 Crushers, (P.), B., 3, 164, 405, 485, 628.  
 rollers for, (P.), B., 580, 661.  
 for coke, etc., (P.), B., 212, 661.  
 for stone, draw-rods for, (P.), B., 85.  
 for waste tins, etc., (P.), B., 214.  
 cone, gyratory, (P.), B., 213\*.  
 gyratory, (P.), B., 787.  
 hammer, (P.), B., 2, 3, 580, 661.  
 Crustacea,  $\alpha$ -lipase and amylase in blood of, A., 956.

Cryoconite, from E. Greenland, A., 1229.  
 Cryolite, flotation treatment of, (P.), B., 340.  
 working up of, (P.), B., 305.  
 Cryoscope, Hortvet, A., 1012.  
 Cryoscopy, applications of, to biology, A., 1203.  
 Cryostat, simple automatic, A., 357.  
 Cryptohæmin, A., 763, 1052.  
*Cryptomeria*, decay of wood of, by dry-rot, B., 384.  
*Cryptomeria japonica*, physiological and geological characters of forests of, A., 660.  
 Cryptopyrrole, derivatives of, A., 285.  
 Cryptorchidism, effect of, on gaseous and nitrogenous metabolism, A., 656.  
 Cryptotoxins, A., 654.  
 properties of, A., 1170.  
 Crystals, structure of, A., 11.  
 X-ray apparatus for determining, A., 449.  
 with Weissenberg photographs, A., 681.  
 in thin sheets, A., 325, 893.  
 and double refraction, A., 10.  
 and elastic strength, A., 565, 986.  
 mosaic and secondary structure of, A., 564.  
 structure of X-ray absorption edges of, A., 979.  
 determination of crystal axes of wires of, A., 1192.  
 as continuous media, A., 1078.  
 atomic and ionic dimensions in lattices of, A., 326.  
 lattice constants of, by X-ray measurement, A., 1192.  
 variation in, with wave-lengths, A., 325.  
 determination of lattice dimensions of, A., 450, 1078.  
 electronic interference in lattice of, A., 3.  
 formation of layer lattices in, A., 903.  
 spherical lattice packing in, A., 1078.  
 two-dimensional space lattice of, A., 113.  
 notation for constants of, A., 986.  
 grating constants of, A., 796.  
 resolving power of gratings of, A., 3.  
 domains of atoms and ions in, A., 11.  
 electronic binding in, A., 902.  
 ionic states in, A., 1190.  
 spacing of non-polar molecules in, A., 904.  
 rotation of molecules in, A., 798.  
 development of nuclei in, A., 450.  
 inhomogeneities in, A., 11.  
 twinning of, A., 450.  
 molecular dynamics in, A., 217.  
 cleavage of, A., 452.  
 distortion of, in stretched wire, A., 681.  
 strain of, on stretching, A., 452.  
 uniform impurities in, after tempering, A., 986.  
 growth of, A., 113.  
 optical constants of, in the ultra-violet, A., 447.  
 stereochemistry of, A., 682, 796, 986.  
 reflecting power of, A., 796.  
 absorption of light by, A., 669.  
 absorption spectra of, A., 673.  
 Raman effect in, A., 675, 792.  
 diffraction of electrons by, A., 3, 670, 893, 980.  
 diffraction of cathode rays by, A., 979.  
 diffraction of rays of protons from, A., 4.  
 reflexion of atoms from, A., 669.  
 reflexion of electrons by, A., 980, 1185.  
 reflexion of X-rays by, A., 325, 902.  
 scattering of fast cathode rays by, A., 552.  
 scattering of X-rays by, A., 892.

**Crystals**, self-contained X-ray apparatus for analysis of, A., 245.  
 photo-electric effect in, A., 8, 983.  
 photochemical processes in, and detection of the latent image, A., 28.  
 permanent electric and magnetic moments of, A., 12.  
 magnetisation of, A., 327.  
 magnetostriction of, A., 13.  
 magnetic analysis of, A., 1078.  
 determination of density of, A., 1193.  
 adsorption of electrolytes by, A., 223, 332, 689.  
 energy changes and secondary structure of, A., 11.  
 chemistry of, A., 681.  
 attachment of accessory minerals to faces of, A., 682.  
 produced by solidification of fused substances containing dyes, A., 118.  
 bent, determination of elastic tension in, with X-rays, A., 218.  
 cubic, electrostatic potential of, A., 793.  
 heteropolar, stability of, A., 452.  
 adsorption at surfaces of, A., 688.  
 homopolar, equilibrium of, A., 986.  
 inoculation, A., 244.  
 ionic, lattice structure of, A., 1078.  
 grating theory of, A., 564.  
 light-sensitive, ultra-microscopy of, A., 821.  
 liquid, absorption spectra of, A., 673.  
 behaviour of, in electrical fields, A., 214.  
 mixed, optical properties of, A., 561.  
 resistance limits in, A., 907.  
 relation between solid solutions and, A., 14.  
 non-conducting, photo-electric primary currents in, A., 983.  
 non-conducting and non-volatile, A., 321.  
 organic, coloured stratifications in films of, A., 333.  
 oscillating, A., 985.  
 paramagnetic, magnetic susceptibilities of, A., 1191.  
 photosensitive, rectification of alternating current by, B., 431.  
 pyroelectric, A., 219.  
 twinned, projection of, A., 219.  
 uniaxial, depolarisation of Raman lines in, A., 212.  
 wetted, tensile strength of, A., 13.  
**Crystal violet**, dark and light reactions of alcoholic leucocyanide solutions of, A., 821.  
**Crystalline liquids**, X-ray structure of, A., 450.  
 salts, inner adsorption in, A., 332, 991.  
**Crystallisation** (P.), B., 663, 1012.  
 fibrillograms of lines of force in, A., 994.  
 influence of magnetic field on, A., 567.  
 kinetics of, A., 986.  
 velocity of. See under Velocity.  
 of salts, (P.), B., 505.  
 of supercooled liquids, A., 796.  
 electrolytic, A., 473.  
 isomorphous, of small amounts of substances with crystallising salts, A., 1198.  
 rhythmic, of melts, A., 1085.  
 selective, (P.), B., 822.  
**Crystallisation apparatus** (P.), B., 325, 484, 486, 917.  
 vacuum-cooling in, B., 484.  
**Cucumber**, control of beetles on, B., 813.  
 control of downy mildew in, B., 278.  
 antiscorbutic action of extracts of, A., 658.  
**Culture solutions**, variation of oxygen content of, A., 435.

**Cumaldehyde**, condensation of, with its phenylhydrazone, A., 159.  
 $\psi$ -**Cumene**, separation of mesitylene from, A., 607.  
 $\psi$ -**Cumidine salts**, A., 1124.  
*Cumingia tellinoides*, oxygen consumption by, in fertilisation, A., 82.  
**Cuminoylnaphthoic acids**, and their acetoxy lactones, A., 374.  
 $5\text{-}\psi$ -**Cumylacetic acid**, derivatives of, A., 1133.  
 $5\text{-}\psi$ -**Cumylacetone**, synthesis of, A., 1133.  
 $\alpha\text{-}6\text{-}\psi$ -**Cumyl- $\beta$ -(2-naphthyl)thiocarbamide**,  $\alpha$ -5-chloro-, A., 154.  
 $\psi$ -**Cumyl-6-thiocarbimide**, 5-chloro-, A., 154.  
 Cuprene, use of, in explosives, B., 528.  
**Cupric salts**. See under Copper.  
**Cuprioxalic acid**, potassium salt, photolysis of, A., 479.  
**Cuprotungstite**, from Arizona, A., 1228.  
**Cuprous salts**. See under Copper.  
*Curcuma domestica*, constituents of rhizomes of, A., 1178.  
**Curie points**, A., 13.  
 discontinuous distribution of, A., 325, 452.  
**Curie-Weiss law**, A., 900.  
**Currant bushes**, leaf curl in, B., 571.  
**Currosonin**, A., 647.  
**Curtius reaction**, modified, A., 252, 375.  
**Cutch**, differentiation of gambier, kino, and, B., 852.  
**Cyanamide**, production of, B., 21, 1027; (P.), B., 103.  
 from calcium cyanamide, (P.), B., 885.  
**Cyanamides**, A., 1098.  
 manufacture of, (P.), B., 421.  
**Cyanenine salts**, synthesis of, A., 1038.  
**Cyanic acid and Cyanides**. See under Cyanogen.  
**Cyanin chloride**, A., 1140.  
 synthesis of, A., 1038.  
**Cyanines**, A., 1263.  
 titration of, electrometrically, A., 952.  
**Cyanine dyes**, A., 282, 756.  
 $\psi$ -**Cyanine dyes**, production of, (P.), B., 716.  
 containing  $\beta$ -naphthaquinoline nuclei, production of, (P.), B., 765.  
**Cyanogen**, and its halides, A., 674.  
 recovery of, from coke-oven gas, B., 420.  
 red band spectrum of, A., 211.  
 ultra-violet absorption spectrum of, A., 558.  
 vibration spectrum of, A., 982.  
 electron affinity of, A., 791.  
 polymerisation of, in presence of catalysts, A., 820.  
 photochemical polymerisation of, A., 349.  
 gaseous, action of, on phenols, A., 1245.  
**Cyanogen compounds**, condensation products from, (P.), B., 591.  
**Cyanogen fluoride**, preparation and properties of, A., 31.  
**Hydrocyanic acid**, structure and physical properties of, A., 795.  
 manufacture of, catalytically, (P.), B., 504.  
 and its salts, (P.), B., 101, 884.  
 infra-red absorption spectra of, A., 108.  
 entropy of, A., 1205.  
 action of, on halides of ter- and quadrivalent metals, A., 351.  
 alkali salts, production of, (P.), B., 724, 799.  
 alkali-carbon briquettes for, (P.), B., 145, 421.  
 cadmium salt, stability of electroplating solutions of, B., 67.  
 iron salt, compounds of, with hexamethylenetetramine, A., 1009.  
 determination of, A., 924.

# **Cyanogen:—**

**Hydrocyanic acid**, lithium salt, A., 1098.  
 mercuric salt, reduction of, by tin, A., 30.  
 complex molybdenum salt, A., 584, 1100.  
 nickel salt, complex radical of, A., 449.  
 potassium salt, reaction of, with sugars, A., 834.  
 effect of, on acetic acid fermentation, A., 94.  
 potassium silver salt, determination of silver in, A., 922.  
 zinc salt, effect of mercury in electroplating solutions of, B., 66.  
 compound of aluminium chloride and, A., 132.  
 in sorghum, Sudan grass, etc., A., 888.  
 from fungi, A., 888.  
 and its glucosides in plant metabolism, A., 436.  
 detoxification of, with dihydroxyacetone and glucose in tissues, A., 88.  
 hyperglycemia from, A., 424.  
 detection of, toxicologically, A., 879.  
 determination of, in coal gas, B., 824.  
**Cyanides**, recovery of, from solutions used in treatment of gold ores, etc., (P.), B., 102, 241.  
 recovery of precious metals from solutions of, (P.), B., 181.  
 deaeration of solutions of, B., 463.  
 action of, on gold, A., 705.  
 effect of, on cellular oxygen consumption, A., 774.  
 complex, A., 814.  
 crystal structure of, A., 903.  
 analysis of, A., 34.  
**Cyanic acid**, synthesis of, by ammoniacal oxidation of carbon compounds, A., 727.  
 sodium salt, manufacture of, (P.), B., 181.  
 detection of, in presence of cyanides, A., 588.  
**Cyanohydrins**, formation of, A., 613.  
**Cyano-ketones**, alkylation of, A., 744.  
**Cyclanes**, Raman spectra of, A., 559.  
**Cyclanones**, transposition in alkylation of, by Haller's method, A., 57.  
*apocyclene*, A., 1037.  
**Cyclic dibromides**, isomeric, configuration of, from dipole moments, A., 984.  
 compounds, hydrogenation of, A., 378.  
**Cyclitol series**, passage of hexose series to, A., 834.  
*Cynara scolymus*. See Artichokes, globe.  
*Cyprinus carpio*. See Carp.  
**Cyrtolite**, Canadian, A., 492.  
**Cysts**, dermoid, A., 768.  
**Cysteine**, hydrogenation of, in system amino-compound-aldehyde-hydrogen, A., 1114.  
 oxidation of, with hydrogen peroxide, A., 1023.  
 catalysis of, by iron and copper, A., 27.  
 spontaneous oxidation of, A., 1095.  
 autooxidation of, A., 129.  
 and its derivatives, mechanism of sulphur lability in, A., 511.  
 compound of, with copper sulphate, A., 936.  
 derivatives, alkaline deamination of, A., 150.  
 arylthioarsinites of, A., 1268.  
 prevention of blood coagulation by, A., 532.  
 as substitute for cystine in nutrition, A., 422.  
 inactivation of insulin by, A., 96.  
 inhibition of liver-arginase by, A., 1167.  
 detection of, colorimetrically, A., 530.

*S*-Cysteinesulphonic acid, salts of, A., 936.  
 Cystine, A., 867.  
   in pasture grass, B., 39.  
   oxidation of, in acid solution, A., 1118.  
     by iodine, A., 702.  
   oxidation-reduction potential of, A., 472.  
   action of mercuric salts on, A., 49.  
   action of sodium sulphite on, A., 936.  
   metabolism of. See under Metabolism.  
   biological reduction of, A., 1062.  
   substitutes for, in nutrition, A., 422.  
   in human hair, A., 870.  
   as factor in wool production, A., 646, 1274.  
   determination of, in glutelins, A., 105.  
     in proteins, A., 206.  
*r*-Cystine, resolution of, A., 49.  
*l*-Cystine, barium salt, A., 936.  
 Cystine-*NN'*-disulphonic acid, and its potassium salt, A., 1023.  
 Cytisine, constitution of, A., 1146.  
 Cytochrome, constitution of, A., 627.  
   absorption spectrum of, A., 184.  
 "Cytotropism," physical nature of, A., 294.

## D.

Dacite from Börzsöny Mts., Hungary, A., 1107.  
   of Lassen Peak, A., 39.  
 Dahlias, control of leaf-hoppers on, B., 571.  
   yellow, dye of, and its dimethyl ether, A., 621.  
 Dairies, sterilisation of equipment in, B., 861; (P.), B., 914.  
   corrosion of equipment in, B., 509.  
   treatment and disposal of waste waters from, B., 482.  
 Dairy products, preservation of, B., 861.  
   pasteurisation of, (P.), B., 912\*.  
   machines for, (P.), B., 1007.  
   effect of carbonation on bacterial content and keeping quality of, B., 45.  
   detection in, of gelatin, B., 1102.  
   determination in, of chlorides, B., 284.  
 Dakin's solution, alkalinity of, and its determination, B., 1028.  
 Daphnids, resistance of, to mercuric chloride, A., 1285.  
 Dates, mineral constituents of, A., 976.  
   dried, vitamin content of, A., 1173.  
 Daubreeite, in Chilean hexahedrite, A., 1230.  
 Debye effect in viscous dielectrics, A., 9.  
 Debye-Hückel theory, A., 22.  
*Δ*<sup>7</sup>-Decadiene, A., 40.  
 Decahydronaphthalene, B., 493.  
   production of  $\gamma$ -lactone of, (P.), B., 1055.  
 Decahydronaphthalene, 9-bromo-, A., 848.  
*cis*-Decahydronaphthalene, isomerisation of, into the *trans*-form, A., 1122.  
*trans*- $\beta$ -Decahydronaphthalene, comparison of corresponding compounds of *cyclohexane* and, A., 1032.  
   derivatives, effect of  $\alpha$ -methyl group on tautomerism of, A., 1032.  
 Decahydronaphthalenes, 9-substituted, preparation of, A., 848.  
 Decahydronaphthalene series, A., 848.  
 Decahydronaphthalene-10-acetic acid, 9-hydroxy-, ethyl ester, and its derivatives, A., 848.  
*trans*-Decahydronaphthalene-2-acetic acids, 2-hydroxy-, and their ethyl esters, isomeric, A., 1032.  
 Decahydronaphthalene-2-*spirocyclohexane*-2':6'-dione, A., 1032.  
*trans*-Decahydronaphthalene-2- $\alpha$ -propionic acids, 2-hydroxy-, ethyl esters, A., 1033.  
*α*-Decahydronaphthalones, oximes, benzoyl derivatives, A., 1133.

*trans*-Decahydronaphthylidene-2-acetic acids, and their derivatives, A., 1032.  
*trans*-Decahydronaphthylidene-2-acetone, and its semicarbazones, A., 1033.  
*trans*-Decahydronaphthylidene-2- $\alpha$ -propionic acid, and its derivatives, A., 1033.  
 Decalin. See Decahydronaphthalene.  
 Decalone. See Decahydronaphthalene.  
 Decamethyl- $\beta$ -methylcellotrioxide, A., 501.  
*n*-Decane, production of, from petroleum, B., 760.  
 Decane-1:10-diamidine, salts, A., 55.  
*n*-Decan- $\beta$ -one, and its semicarbazone, A., 832.  
 $\Delta^4$ -Decan- $\beta$ -one, and its  $\beta$ -semicarbazido-semicarbazone, A., 832.  
*n*-Decatetraenol, preparation of, and its derivatives, A., 496.  
   pure, properties of, A., 1109.  
 $\Delta^8\delta^5$ -Decatrienoic acid, A., 365.  
 Decinenes, A., 142.  
 Decodistearins, A., 364.  
 Decoic acid, *p*-chlorophenacyl ester, A., 744; glyceryl ester, A., 1018.  
 Decoic acid,  $\lambda$ -hydroxy-, polyethylene ester, A., 601.  
*α*-*n*-Decyl-*n*-hexadecoic acid, and its *tri*-bromoanilide, A., 720.  
*n*-Decylidenebisdimethyldihydroresorcinol, A., 1235.  
*n*-Decylmalonic acid, ethyl ester, A., 720.  
*n*-Decyl-*n*-tetradecylmalonic acid, A., 720.  
 De-*N*-dimethylaphyllidine, and its methiodide, A., 406.  
 De-*N*-dimethylaphylline, and its methiodide, A., 405.  
 De-*N*-dimethyldihydrocytisine, and its salts, A., 1146.  
 De-*N*:*O*-dimethyl- $\psi$ -strychninium hydroxide, A., 1147.  
 De-ethoxydehydroserolemethine, synthesis, A., 288.  
 Deguelin, A., 751, 950.  
 Dehydration, apparatus for automatic registration of, A., 1227.  
 Dehydrators, (P.), B., 84.  
 Dehydrobilirubin, A., 1266.  
 Dehydro-*n*-butyrylacetic acid, A., 1256.  
 Dehydro-*p*-chlorobenzylidenedi- $\beta$ -naphthol, A., 279.  
 Dehydrocholic acid, bromination of, A., 1029.  
   sodium salt, diuresis from, A., 961.  
 Dehydrocital semicarbazone, A., 600.  
 Dehydrodeoxycholic acid, bromination of, A., 1029.  
 Dehydrodeoxycholic acid, 2-hydroxy-, and its acetyl derivative, A., 1029.  
 Dehydrodipeptidase, A., 427, 777.  
 Dehydrodivanillin methyl ether, and 4:4'-dinitro-, and its dimethyl ether, A., 385.  
 Dehydroergostene, A., 845.  
 Dehydroergosterone, and its oxime, and bromo-, A., 1127.  
*dl*-Dehydroseretholemethine, synthesis and resolution of, A., 288.  
 Dehydrogenation, A., 1120.  
   catalysts for, (P.), B., 261.  
 Dehydrogeranic acid, A., 144, 1111.  
   synthesis of, and its methyl ester, A., 600.  
 Dehydromesobilirubin. See Glucobilin.  
 Dehydro- $\beta$ -naphthol 1-sulphides, *mono*- and *di*-bromo-, A., 379.  
 Dehydronetric acid, A., 855.  
 Dehydroresermethole, A., 759.  
 $\Delta^1$ -Dehydroisopulegol, and its derivatives, A., 619.  
 Dehydro-*l*-thebenoneketone-(7)-furan, bromo-derivatives of, A., 1049.  
 Dehydrothio-oleanolic acid, methyl ester, A., 749.

Dehydrothio-*p*-toluidinesulphonic acid, derivatives of, A., 176.  
 Dehydrotoxicarol, oxidation of, A., 619.  
 Dehydroapotoxicarol, A., 855.  
 Dehydrotoxicarolcarboxylic acid, and its derivatives, A., 856.  
 Deliquescent substances, preparation and mounting of, A., 492.  
   dissolving of, (P.), B., 4.  
 De-*N*-methylaphyllidine, and its methiodide, A., 406.  
 De-*N*-methylaphylline, and its methiodide, A., 405.  
 De-*N*-methyldihydrocodeine, action of ozone on, A., 178.  
 Demethyleneanhydrotetramethylstrychnine, and its derivatives, A., 629.  
 Demethylotetrandrine, and its derivatives, A., 1048.  
 3'-De-*O*-methylpapaverine. See 6:7-Dimethoxy-1-(3'-hydroxy-4'-methoxy)-benzylisoquinoline.  
 De-*N*-methylsinomeninofurazan, bromo-derivatives of, A., 1049.  
 De-*N*-methyltetrahydrodeoxycodeine, and its derivatives, A., 408.  
 Demihelions, A., 790.  
 Density (*specific gravity*), determination of, A., 593.  
   volumetrically, A., 322.  
   comparison of, by the balancing column method, A., 492.  
   at absolute zero, A., 902.  
 Dental caries, vitamin factor in, A., 1278.  
   in rats, attempts to produce, A., 1057.  
   analysis of teeth in, A., 1278.  
 Dental enamel, structure of, A., 1275.  
   solubility of, in buffered solutions, A., 1275.  
 Dental fillings, gold, (P.), B., 1037.  
 Dentifrices, production of, (P.), B., 960.  
 Dentistry, testing of amalgams used in, B., 941.  
   palladium alloy for use in, (P.), B., 191.  
   use of platinum and its alloys in, B., 266.  
   resinous compositions for use in, (P.), B., 475.  
   artificial stones for use in, B., 308.  
 Dentures, plastic material for, (P.), B., 614.  
   rubber for, (P.), B., 779.  
   thermoplastic compositions for, (P.), B., 119.  
   styrol, (P.), B., 1042.  
 Deoxidisers, (P.), B., 465.  
 Deoxybenzanisols, isomeric, A., 946.  
 Deoxybenzoins, preparation of, A., 158.  
 Deoxybibilanic acid, hydroxy-, and dihydroxy-, and its derivatives, A., 615.  
 Deoxybibilanic acids, derivatives of, A., 1248.  
 Deoxycholic acid, resolution of, A., 144.  
   additive compound of, with ethyl acetoacetate, A., 366.  
   sodium salt, action of, on membrane and tissue constituents, A., 877.  
   acetyl derivative, A., 1248.  
 Deoxycodeine, A., 408.  
 1:6-Deoxy-2:3:4:5-dimethylene mannitol. See  $\beta$ -*De*-Di(methylenedioxy)hexane.  
 Deoxyhydrocinchonidine, and its hydrogen dianisoyl-*d*-tartrate, A., 290.  
 Deoxyhydrocinchonine, A., 290.  
 $\alpha$ -Deoxymannitol. See Hexane,  $\beta$ -*De*-tetrahydroxy-.  
 Deoxypicropodophyllin, A., 618.  
 Deoxypropyrophæorhobide, and its oxime, A., 625.  
 Deoxy- $\alpha$ -isostrophanthonic acid, and its derivatives, A., 748.  
 Deoxytetrahydroartemisins, A., 271.  
 Dephlegmation apparatus, (P.), B., 86, 965, 1061.



- Dephlegmation apparatus, cleaning of, (P.), B., 51.  
 Depsides, synthesis of, A., 1030.  
 Dermatitis, dyes causing, B., 637.  
   in printing works, treatment of, B., 1117.  
 arspenamine, blood-sugar in, A., 872.  
 Derric acid, synthesis of, A., 751.  
   esters, A., 619.  
*Derris elliptica*, constituents of, A., 751.  
 Derris root, active principle of, A., 400, 860.  
 Derritol, constitution of, A., 860.  
   oxime, A., 400.  
 Derritols, derivatives of, A., 950.  
 Desensitisers, A., 578.  
 Deserts, crusts deposited in, A., 1014.  
 Desmo-cathepsin, A., 881.  
 Desmo-pepsin, A., 881.  
 Desorption for absolute temperature measurements, A., 332.  
 Detectors, nature of action of, A., 1189.  
 Detergents, (P.), B., 270, 435, 678.  
   manufacture of, (P.), B., 1072, 1114.  
   measurement of efficiency of, B., 418.  
   soap stocks and, B., 354.  
   alkaline salt solutions as, B., 546.  
   use of proteins of oil-bearing seeds as, B., 994.  
   sodium silicate as, B., 312.  
 Detonating caps, (P.), B., 753, 818.  
 Detonation, dilution theory of, A., 127.  
 Detonators, blasting, electric, delay-action, (P.), B., 753.  
 Deuteroporphyrin III, and its diacetyl derivative, and their derivatives, A., 173.  
 Dextran, formation of, from sucrose by *Leuconostoc mesenteroides*, A., 45.  
   immunological action of, on bacterial antisera, A., 884.  
 Dextrin, conversion of starch into, (P.), B., 77.  
   manufacture of adhesives from, (P.), B., 783.  
   pastes of starch and, for treatment of textiles, B., 1050.  
   potato, manufacture of, B., 239.  
   determination of, in beer, B., 783, 957.  
 $\alpha$ -Dextrin, A., 604, 1021.  
   dependence of molecular magnitude in, on  $pH$ , A., 724.  
 Dextrins, manufacture of, from cellulose materials, (P.), B., 1101.  
   water-soluble, formation of, from cellulose, A., 1022.  
 Dextrose, manufacture of, (P.), B., 397.  
   action of boric acid and borates on rotatory power of, A., 120.  
   production of glycerol and pyruvic acid in cell-free fermentation of, A., 194.  
   decomposition of, in blood, A., 182.  
   effect of administration of water and, on blood, A., 413.  
   kidney threshold for, in diabetes and non-diabetes, A., 187.  
   hydrate, manufacture of, (P.), B., 42.  
   determination of, in maize, A., 437.  
   effect of urea on, by the formose reaction, A., 1276.  
 $\alpha$ - and  $\beta$ -Dextrose tetraacetates, A., 835.  
 Diabase of the Dill district, A., 926.  
 Diabetes, kidney threshold for dextrose in, A., 187.  
   tolerance of galactose in, A., 872.  
   hyperglycæmia in, A., 1157.  
   oral treatment of, A., 296.  
   Chinese anti-drugs for, A., 541.  
   effect of insulin, synthalin, and Karlsbad water on, A., 80.  
   administration of invert sugar with insulin in, A., 80.  
   afternoon, A., 1157.  
 Diabetes, pancreatic, metabolism in, after injection of fats, A., 418.  
   pancreatic, effect of sodium hexosediphosphate on, A., 872.  
   pancreatic and phloridzin, effect of organs on acetone in blood in, A., 80.  
   phloridzin, influence of, on metabolism in thyroidectomy, A., 191.  
   determination in, of blood-sugar, A., 878.  
   renal, A., 961.  
   determination of creatinine in blood in, A., 297.  
 Diacenaphthyl 5:5'-disulphide, A., 839.  
*sym-pp'*-Diacetodiamidodiphenylazodicarbonamide, A., 367.  
 1:2-Diacetofluorene, and its derivatives, A., 516.  
 1:2-Diacetofluorenone, and its triphenylhydrazones, A., 516.  
 6:8-Diaceto-2-methylnaphthalene, and its oxime, A., 1250.  
 Diacetone alcohol. See *iso*Hexan-8-ol- $\beta$ -one.  
 Diacetoneamine, preparation of, A., 371.  
 Diacetonyl sulphide, A., 368.  
 Diacetylmidmethylammonium picrate, A., 854.  
 1:8-Diacetoxyanthraquinone-3-carboxylic acid, chloride of, A., 1252.  
 5:5'-Diacetoxy-4:4'-dimethoxy-2:2'-diphenylene oxide, 6:6'-dichloro-, A., 853.  
 3:4'-Diacetoxy-3:5-di-(*O*-tetra-acetyl- $\beta$ -glucosidoxy)flavylium chloride, 7-hydroxy-, A., 1141.  
*s*-Di-( $\alpha$ -acetoxyethyl)carbamide, *di- $\beta\beta\beta$ -trichloro*-, A., 151.  
 Di(acetoxymercuri)acetoacetanilide, A., 937.  
 Di(acetoxymercuri)acetoacetic acid, ethyl ester, A., 937.  
 Di(acetoxymercuri)acetoacetanaphthylamides, A., 937.  
 Di(acetoxymercuri)acetoaceto-*m*-nitroanilide, A., 937.  
 Di(acetoxymercuri)acetoacetotoluides, A., 937.  
 Di(acetoxymercuri)acetoacetoxylidides, A., 937.  
 Di(acetoxymercuri)malonic acid, ethyl ester, A., 937.  
 4:6-Diacetoxy-3-methoxyphenanthrene, 1-bromo-, A., 290.  
 Diacetoxypheylloxan, A., 63.  
 2:5-Diacetoxy-2:3:5:6-tetraphenyldioxan, A., 63.  
 Diacetyl. See Dimethyl diketone.  
 Diacetylnaphthenes, and their derivatives, A., 854.  
 2:5-Di-*p*-acetylaminocyclohexadiene-1:4-dicarboxylic acid, ethyl ester, A., 754.  
 2:5-Di-*p*-acetylanilincyclohexadiene-1:4-dicarboxylic acid, ethyl ester, A., 754.  
 Diacetylbenzofuran-4:7-quinone dioxime, A., 52.  
 2:3-Diacetylbenzylidene- $\beta$ -methylglucoside, A., 254.  
 Diacetylstyrenes, derivatives of, A., 49.  
 Diacetyldehydrodivanillin, 4:4'-dinitro-, A., 385.  
 3:3'-Diacetyl-5:5'-dicarboxy-4:4'-dimethylpyrromethane, A., 1045.  
 2:6-Diacetyl-3:5-di(trichloromethyl)toluene, 2:6-ditrichloro-, A., 851.  
 3:19-Diacetyl-6:9-dihydro-5:22-dihydroxyacriquinoline, A., 754.  
 4:5-Diacetyl-1:2:3:6-dioxiazine dioxime, and its derivatives, A., 499.  
 4:4'-Diacetyldiphenyl, 4:4'-dichloro-, A., 261.  
 Diacetyldiisopropylidenequinic acid, derivatives of, A., 850.  
 Diacetylevernic acid, methyl ester, synthesis of, A., 1258.  
 1:2-Diacetylfluorene, and its derivatives, A., 1251.  
 1:2-Diacetylfluorenone, and its triphenylhydrazones, A., 1252.  
 Diacetyluroxan dioxime, and its benzoyl derivative, A., 499.  
 $\beta\gamma$ -Diacetylgycceraldehyde, A., 368.  
 Diacetylgycceryl chloride, A., 623.  
 6-Diacetylgyccerylamido-2-methylquinoline methiodide, A., 623.  
 Diacetylgyloxime peroxide, A., 499.  
 (Diacetyl-*l*-leucyl)glutathione, dichloro-, A., 762.  
 Di(acetyl-*l*-leucylglycyl-*l*-leucyl)glutathione, dichloro-, A., 762.  
 $\alpha\zeta$ -Diacetyl-*d*-mannitol  $\beta\gamma\delta\epsilon$ -tetraabenzozoate, A., 929.  
 Diacetylmercuridiphenyls, dihydroxy-, A., 410.  
 3:3'-Diacetylmercuridiphenylmethane-5:5'-dicarboxylic acid, 4:4'-dihydroxy-, A., 410.  
 Diacetylmethane, and its salts, A., 933.  
 $\alpha\alpha$ -Di-(4-acetyl-5-methyl-3-ethyl-2-pyrryl)-ethane, A., 1263.  
 2:3-Diacetylmethylglucoside 5:6-carbonates, A., 1020.  
 2:3-Diacetyl- $\beta$ -methylglucoside, and its derivatives, A., 254.  
 2:4-Diacetyl-3-methyl- $\beta$ -methylglucoside, and its derivatives, A., 255.  
 2:4-Diacetyl-3-methyl- $\beta$ -phenylmethyl- $\beta$ -methyl- $\alpha$ -glucoside, A., 255.  
 Diacetylmethyltetrahydroderritol oxime, A., 400.  
 4:5-Diacetylnaphthalic acid, derivatives of, A., 854.  
 Diacetylsorsellinoyl chloride, A., 1258.  
 4:6-Diacetyl-*m*-phenylenediglycollic acid, and its derivatives, A., 860.  
 Di-(1-acetyl-2-piperidylmethyl)amine, A., 256.  
 Diacetyltetrahydrostrychnine methiodide, A., 407.  
 1:5-Diacetyl-3-thiolindole, A., 753.  
 2:3-Diacetyl-4-*p*-toluenesulphonyl- $\beta$ -methylglucoside, and 6-iodo-, and its nitrate, A., 254.  
 4:4-Diacetyl-1:2:6-triphenyl-1:4-dihydropyridine, A., 1263.  
 Diacetyl-*dl*-tyrosine, A., 1238.  
 Diacetylohimine, oxidation of, A., 760.  
 Diacolation, B., 400, 575.  
 Dial, anæsthetic action of, A., 88.  
 Di-(*dl*-alanyl)-*dl*-alanine, A., 503.  
 Di-*l*-alanyl-*l*-alanine, A., 194.  
 Di-*l*-alanyl-*l*-alanyl-*l*-glycine, A., 71.  
*N*-Dialanylglycosamine. See *N*-Propionylglycosamine, *N*- $\alpha$ - $\alpha'$ -diamino-,  $\alpha'$ -propionyl derivative.  
 1:5-Di-*o*-aldehydophenylanthraquinone, and its derivatives, A., 400.  
 5:6-Dialkoxy-8-aminoquinolines, manufacture of *N*-substituted derivatives of, (P.), B., 14.  
 Dialkyl sulphates, manufacture of, from olefins, (P.), B., 973.  
*p*-Dialkylaminobenzophenones, synthesis of, A., 386.  
 Dialkylaminomethyl alcohols, esters of, A., 845.  
*p*-Dialkylanilines, condensation of, with benzanilides, in presence of phosphoryl chloride, A., 386.  
 Dialkylbarbituric acids, determination of, in urine, A., 640.  
 5:5-Dialkylbarbituric acids, alkali salts, manufacture of, (P.), B., 448.  
 Dialkyl ketones, formation of, from ethyl ethers of  $\alpha$ -glycols, A., 368.

- Dialkylmalonic acids, menthyl esters, rotation of, in solution, A., 1083.
- Dialkylsulphonamido-group, directive influence of, in benzene ring, A., 940.
- Diallylactic acid, action of peracetic acid on, A., 833.
- 3:6-Diallylamino-1:2:4:5-tetrazine, A., 172.
- $\alpha\alpha$ -Diallylbutyronitrile, A., 727.
- Diallylmalonic acid, action of peracetic acid on, A., 833.
- Diallyl-1-phenyl-3-methylbarbituric acid, A., 283.
- Dialogite, paramagnetic rotation of, A., 448.
- Dialuric acid, spontaneous oxidation of, A., 404.
- oxidation of amino-acids by, A., 404.
- Diamagnetism of inorganic compounds, A., 678, 1077.
- additivity law for, A., 985.
- of mixed liquids, A., 10, 112, 216, 678.
- ionic, A., 795.
- Diamidine, dicyano-, reaction of, with amines, A., 504.
- Diamines, configuration of, A., 606.
- manufacture of diacyl derivatives of, (P.), B., 763.
- aromatic, manufacture of acyl derivatives of, (P.), B., 763.
- detection of, in dyed leather, B., 652.
- $\alpha$ -Diamines, disecundary, formation of, A., 846.
- $\alpha\beta$ -Diamines, aliphatic, A., 256.
- Diamond, origin of, in South and West Africa, A., 492.
- cathode luminescence of, A., 109.
- photoconductivity of, A., 446.
- adsorption by, of dyes, A., 908.
- electroplating apparatus for mounting of, (P.), B., 898.
- manufacture of tools from fragments of, (P.), B., 467.
- artificial, production of, (P.), B., 935.
- Diamond windows for high pressures, A., 1014.
- Diamylacetylene, A., 142.
- Diamylaminobarbituric acid, 5-bromo-, A., 283.
- Diisoamylaminomethyl alcohol, esters of, A., 845.
- 1:4-Diisoamyl-1:4-dihydroanthracene, A., 941.
- 4:4-Diisoamyl-3:5-diketopyrazolidine, A., 1143.
- $NN'$ -Diamylguanidine salts, A., 605.
- $\alpha$ -Diamylose, existence of, A., 255, 1021.
- X-ray spectrum of, A., 338.
- Diisoamylthiolmethane, A., 1114.
- Dianhydro-(2:2'-dimethoxy-5:5'-diformyl-diphenyl ether) bis-2-phenyloxazolone, A., 175.
- 3:6-Dianilino-1:2-dihydro-1:2:4:5-tetrazine, and its hydrochloride, A., 172.
- Di-(anilinoformyl)hydrazine, *di-p*-nitro-, A., 598.
- 2:5-Dianilino-*cyclohexadiene*-1:4-dicarboxylic acids, *dihydroxy*-, ethyl esters, A., 754.
- $\alpha\delta$ -Dianisoylbutane, and its derivatives, A., 63.
- 2:2'-Dianisoyldiphenyl, A., 745.
- Dianisoyl-*d*-tartaric acid, and its esters, A., 290.
- Dianisoyl 4:4'-disulphide, 2:2'-diamino-, and its derivatives, A., 378.
- $\alpha\alpha$ -Dianisylacetone, and its derivatives, A., 394.
- 2:5-Dianisyl-3:4-benzofuran, A., 617.
- 3:6-Dianisyl-4:5-benzpyridazine, A., 617.
- $\alpha\alpha$ -Dianisylbutaldehyde, and its semicarbazone, A., 394.
- $\alpha\beta$ -Dianisylbutane- $\alpha\beta$ -diol, A., 394.
- $\alpha\alpha$ -Dianisylbutyl alcohol, A., 394.
- $\alpha\alpha$ -Dianisyl- $\Delta\alpha$ -butylene, A., 394.
- 9:10-Dianisylidihydrophenanthrenediol, A., 745.
- 3:3'-Dianisyl-4:4'-dimethyldicoumarin, A., 861.
- Dianisylmethyl ethyl ketone, and its derivatives, A., 394.
- Di-*p*-anisyl-3-methyl-1:4-quinomethane, A., 855.
- $\alpha\alpha$ -Dianisylpropaldehyde, and its derivatives, A., 394.
- $\alpha\alpha$ -Dianisyl- $\Delta\alpha$ -propylene, A., 394.
- $\alpha\beta$ -Dianisyl- $\Delta\alpha$ -propylene glycol, A., 394.
- Dianisylselenium dihydroxide, and its salts, A., 70.
- Dianthracene, crystal structure of, A., 327.
- Di-2-anthranil ketone, *di*-9:9-dichloro-, A., 1135.
- 1:4-Dianthraquinonylaminoanthraquinones, amino-, production of, (P.), B., 672.
- 2:2'-Dianthraquinonyl ketone, and 5:8:5':8'-tetrahydroxy-, A., 1136.
- Dianthrnyls, *di*- and *tetra*-chloro-, A., 1241.
- Dianthryl, 3:3'-dichloro-, A., 1241.
- Diaquorhodiumdisulphamide, sodium salt, optically active, A., 1101.
- Diabinosyl disulphide, and its hexaacetate, A., 45.
- $\alpha\delta$ -Diarylbutanes,  $\alpha\delta$ -dibromo-, action of sodium cyanide on, A., 63.
- Diaryl compounds, synthesis of, A., 1121.
- Diarylalkyl glycols, influence of anisyl radical on dehydration of, A., 394.
- Diarylamines, manufacture of, (P.), B., 494.
- Diarylamine-5-carboxylic acids, 3-hydroxy-, manufacture of, and their arylamides, (P.), B., 13.
- Diarylcarbamides, manufacture of, (P.), B., 1020.
- 9:10-Diaryldihydrophenanthrenediols, A., 745.
- Diarylguanidines, production of, (P.), B., 174.
- $\beta$ -Diaryl-methyl-amino-alcohols, manufacture of, (P.), B., 833.
- Diarylphthalides, preparation of, and their halogen-derivatives, A., 613.
- Diarylthiocarbamides, formation of, from arylamines and trithiocarbonates, A., 840.
- Diastore, estimation of alumina in, from silica content, B., 305.
- Diastase, variation of, in blood and urine, A., 1053.
- in skin, and its effect on carbohydrate metabolism, A., 297.
- malt, hydrolysis of starch by, A., 193.
- detection of, in urine, A., 640.
- Diastereomerism, A., 759.
- $\alpha\alpha$ -Diazidoadipic acid, A., 1118.
- Diazoacetic acid, ethyl ester, photochemical decomposition of, A., 706.
- 5-Diazoaminoisoxazole, A., 286.
- Diazoanthraquinones, amino-, manufacture of, (P.), B., 57.
- Diazocamphor, A., 1140.
- Diazo-compounds, A., 155.
- manufacture of, (P.), B., 379, 496.
- velocity of decomposition of, in aqueous solution, A., 345, 1002.
- stabilisation of solutions of, A., 841; B., 1021.
- action of, on unsaturated compounds, A., 609.
- replacement of nitrogen by hydrogen in, catalytically, A., 1119.
- aliphatic, A., 372.
- reaction of, with derivatives of metals, A., 937.
- Diazo-compounds, sensitive to light, A., 155.
- optically active, A., 1140.
- stable, production of, (P.), B., 975.
- p*-Diazo-diethylaniline, complex salts of, A., 155.
- p*-Diazo-dimethylaniline, complex salts of, A., 155.
- p*-Diazo-diphenylamine, complex salts of, A., 155.
- 12:15-Diazo fluorescein, and its tetrabromoderivative, and 1:8-dihydroxy-, A., 66.
- Diazo-hydrates, constitution of, A., 51.
- oxidising properties of, A., 155.
- Diazo-hydroxides. See Diazo-hydrates.
- Diazomethane, syntheses with, A., 383.
- reaction of, with azoimide, A., 1145.
- with mercuri-organic compounds, A., 937.
- use of, in detection of nitrosophenols, A., 734.
- Diazonium group, replacement of, by chlorine or bromine, A., 1244.
- Diazonium salts, colour and structure of, A., 1125.
- reaction of, with sodium alkyl-dithiocarbamates, A., 509.
- 1-Diazo-phenyl-2-hydroxy- $\alpha$ -naphthylmethanes, A., 264.
- Diazo-resins, A., 841, 942.
- Diazosuccinic acid, ethyl ester, and its optical activity, A., 151, 372.
- Diazotates, velocity of decomposition of, A., 1094.
- Diazouracil anhydride, formation of, A., 66.
- 12:15-Diazo- $\alpha$ - $NN'$ -tetraethylrhodamine, A., 66.
- 12:15-Diazo- $\alpha$ - $NN'$ -tetramethylrhodamine, A., 66.
- 1:2:5:6-Dibenzanthracene, preparation of, A., 536.
- and 9-amino-, and 9-hydroxy-, and their derivatives, A., 153.
- 1:2:7:8-Dibenzanthracene, A., 1137.
- and its picate, A., 747.
- 1:2:7:8-Dibenzanthracene-4:5-dicarboxylic acid, A., 747.
- 2:3:6:7-Dibenzanthracene-9:10-diyl, 9:10-dichloro-, A., 608.
- 1:2:5:6-Dibenzanthracene-9:10-*endo*- $\alpha\beta$ -succinic acid, and its disodium salt, A., 153.
- 1:2:7:8-Dibenzanthranil 10-acetate, A., 747.
- 1:2:7:8-Dibenzanthraquinone, A., 747.
- Dibenzanthraquinones, A., 1136.
- Dibenzanthrone dyes, vat, manufacture of, (P.), B., 254, 497, 637, 764, 1073.
- 1:2:5:6-Dibenzanthronyl-9-pyridinium bromide, A., 153.
- Dibenzcarbazole-1:4-quinones, A., 265.
- 2:3:5:6-Dibenzcarbazole-1:4-quinonesulphonic acid, sodium salt, A., 265.
- Di-(1:3-benzodioxinyl)methane, *di*-6-nitro-, A., 950.
- Dibenzeneazophenols, 2:6-dinitro-*o*- and -*p*-nitro-, A., 53.
- 4:6-Dibenzene-sulphonyl-2:3-dimethyl- $\beta$ -methylglucoside, A., 254.
- 2:3:5:6-Dibenzocarbazole, A., 265.
- 2:3:5:6-Dibenzocarbazole-1:4-quinone, A., 265.
- 2:3:5:6-Dibenzocarbazole-1-sulphonic acid, sodium salt, A., 265.
- 2:3:8:9-(*antidiperi*)-Dibenzocoronene-1:4:7:10-diquinone-*Bz*:2:*Bz*:2'-dicarboxylic acid, and its disodium salt, A., 732.
- 2:3:8:9-Dibenzocoronenequinone, A., 732.
- Dibenzoic phthalic anhydride, A., 1129.
- 1:2:7:8-Dibenzoperylene, A., 618.
- Dibenzoperylenes, and their picates, A., 731.

- 1:2:7:8-Dibenzoxanthone. See Dinaphtho-  
γ-pyrone.
- 3:6-Dibenzoyl-9-acetylcarbazole, A., 1041.
- Dibenzoylactylene, *di-o*-amino-, A., 376.
- αβ-Dibenzoyl-α-acetylcyclohexane, pyrrole de-  
rivatives of, A., 1263.
- O,N*-Dibenzoyl-8-aminopentanol, A., 1118.
- 1:5-Dibenzoylanthraquinone, A., 617.
- 1:5-Dibenzoylanthraquinone, *di-p*-chloro-,  
A., 618.
- 1:5-Dibenzoylanthraquinone-2':4':2''':4''-  
tetracarboxylic acid, and its derivatives,  
A., 1136.
- αδ-Dibenzoylbutane, αδ-dibromo-, A., 63.
- 1:2-Dibenzoylcyclobutanes, and their deriv-  
atives, A., 746.
- Dibenzoylcarbazoles, A., 1041.
- Dibenzoylcarbinol, A., 518.
- 2:6-Dibenzoyl-3:4-diacetylglucose, 1-bromo-,  
A., 723.
- Dibenzoyldiacetylmethylglucosides, A., 723.
- αγ-Dibenzoyl-ββ-diacetylpropane, A., 1263.
- 3:3'-Dibenzoyl-4:4'-dimethylbenzophenone,  
A., 1135.
- 4:5-Dibenzoyl-1:2:3:6-dioxadiazine, A., 1146.
- 4:4'-Dibenzoyldiphenylamine, 2-amino-, and  
2-nitro-, A., 1041.
- αδ-Dibenzoyldiphenylethyleneglycol, A., 518.
- 1:2:3:4-Dibenzoylenenaphthalene, A., 1257.
- Dibenzoylenenaphthalenes, manufacture of,  
(P.), B., 497.
- Dibenzoylglyoxime, A., 1267.
- Dibenzoylmethane, action of, with phos-  
phorus pentachloride, A., 616.
- 2:6-Dibenzoyl-β-methylglucoside, A., 723.
- Dibenzoylnaphthalenes, derivatives of, A.,  
839.
- 3:9-Dibenzoyloxy-1:2:7:8-dibenzperylene,  
3:9-*di-p*-bromo-, A., 618.
- αβ-Dibenzoyloxy-αβ-dimesitylethylene, A.,  
1250.
- Dibenzoylperylene, 1-hydroxy-, A., 1035.
- 3:6-Dibenzoyl-9-phenylacetylcarbazole, A.,  
1041.
- 5:4'-Dibenzoyl-1-phenylbenzotriazole, A.,  
1041.
- γδ-Dibenzoyl-8-phenyl-βη-heptadione, A.,  
515.
- 1:2-Dibenzoyl-1-phenylcyclopropanes, and  
their derivatives, A., 385.
- 2:4-Dibenzoylphloroglucinaldehydes, A., 859.
- r*-Dibenzoyltartaric acid, and its anhydride,  
A., 598.
- l*-Dibenzoyltartaric acid hydrate, A., 865.
- meso*-Dibenzoyltartaric anhydride, A., 598.
- 2:6-Dibenzoyl-1:3:4-triacetylglucose, A., 723.
- Dibenzoyl-2:4:6-trimethylbenzoylmethane,  
and its copper salt, A., 1250.
- Dibenzopyrenequinones, manufacture of,  
(P.), B., 253.
- Dibenzopyrenequinone dyes, vat, manufac-  
ture of, (P.), B., 175, 765.
- Dibenzyl. See *s*-Diphenylethane.
- Dibenzylamine, *p*-toluenesulphonyl deriv-  
ative, A., 375.
- Dibenzylaminobarbituric acid, 5-bromo-, A.,  
283.
- Dibenzylaniline, *p*-toluenesulphonyl deriv-  
ative, A., 375.
- 10:10-Dibenzylanthrone, 1-cyano- and 1:8-  
dicyano-10:10-*di-o*-chloro-, A., 395.
- p*-Dibenzylbenzenes, *p-di-o*-chloro- and *p-  
di-o*-hydroxy-, and their acetyl deriv-  
atives, A., 259.
- NN*-Dibenzylcarbonato-*l*-cystine, and its  
chloride, A., 935.
- Dibenzylcarbonato-*l*-cystidylglycine, ethyl  
ester, A., 935.
- Dibenzyl-*m*-cresols, and their derivatives,  
A., 611.
- 1:5-Dibenzyl-9:10-dihydroanthracene-  
2':4':2''':4''-tetracarboxylic acid, and its  
derivatives, A., 1136.
- Dibenzyl-Δ<sup>2</sup>-dihydrophthalide, A., 269.
- Dibenzyltrimethylammonium bromide, *di-p*-  
bromo-, A., 854.
- salts, A., 854.
- 10:10-Dibenzyltrimethylanthrones, A., 745.
- β-1:1-Dibenzyl-2:3:4:5-diisopropylidene-*d*-  
fructose, A., 147.
- 1:1'-Dibenzyl-4:4'-dipyridinium salts, A.,  
170.
- Dibenzyl-2:2'-disulphonic acid, 4:4'-*di*hydr-  
oxy-, derivatives of, A., 730.
- 1:1-Dibenzyl-α-fructose, and its tetra-  
acetate, A., 147.
- Dibenzylglycidic acid, A., 143.
- 2:2-Dibenzylcyclohexanone, formation of,  
and its derivatives, A., 162.
- Dibenzylidenedihydrazinotriphenylmethane,  
derivatives of, A., 733.
- Dibenzylidene-ethylenediamine, *di-o*-hydr-  
oxy-, and its complex salts, A., 57.
- 2:6-Dibenzylidene-4-methylcyclohexanone,  
and its *tetrabromo*-derivative, A., 1032.
- Dibenzylidenecyclopentanones, A., 746.
- α-Dibenzylidene-*m*-phenylenediacetic acid,  
*di-o*-nitro-, and its derivatives, A., 747.
- Dibenzylidenesorbitol, determination of, B.,  
44.
- Dibenzyl ketone, condensation products of,  
with aldehydes and ketones, and their  
derivatives, A., 272.
- ωω-Dibenzyl-*p*-methoxyacetophenone, and  
its semicarbazone, A., 389.
- αα-Dibenzyl-β-methyl-*n*-butanols, β-amino-,  
A., 1126.
- Dibenzylmethylcarbethoxymethylammon-  
ium bromide, A., 605.
- Dibenzylmethylcarbomethoxymethylam-  
monium bromide, A., 605.
- 2:5-Dibenzyl-1-methylpyrrole, A., 622.
- Dibenzyl-naphthalenes, synthesis of, and  
their derivatives, A., 839.
- 6:7-Dibenzoyloxy-1:3'-benzoyloxy-4'-methoxy-  
benzyl-3:4-dihydroisoquinoline, salts of,  
A., 1040.
- 6:7-Dibenzoyloxy-1:3'-benzoyloxy-4'-methoxy-  
benzyl-*N*-methyltetrahydroisoquinoline,  
A., 1040.
- 2:2'-Dibenzoyloxydiphenyl, A., 730.
- 3:4-Dibenzoyloxyphenylacetic acid, A., 1040.
- 3:4-Dibenzoyloxyphenylacetic acid, 2-nitro-,  
A., 56.
- s*-Di-(β-*m*-benzoyloxyphenylethyl)carbamide,  
A., 1040.
- β-3:4-Dibenzoyloxyphenylpropionhydrazide,  
A., 1040.
- αα-Dibenzylpropionitrile, A., 727.
- 1:1-Dibenzylisopropylidene-*d*-fructopyr-  
ranoses, A., 147.
- Dibenzyl-Δ<sup>2</sup>-tetrahydrophthalide, A., 269.
- Diborane, A., 350.
- αβ-Dibromo-acids, condensation of, with  
benzene, A., 382.
- Di-*p*-butoxyphenylselenium dihydroxide,  
and its salts, A., 70.
- Dibutyl ether, melting point of, A., 115.
- di*- and *tri*-sulphides, A., 1018.
- Di-*n*-butylaminomethyl alcohol, esters of,  
A., 845.
- NN*'-Di-*sec*-butylamino-*p*-phenylenediam-  
ine, derivatives of, A., 154.
- Di-*n*-butylarsine, A., 1120.
- 4:4-Dibutyl-3:5-diketopyrazolidine, A., 1143.
- Diisobutylene, composition of, A., 1109.
- Dibutylmalonic acid, menthyl esters, A.,  
1083.
- 1:4-Diisobutyl-1:2:3:4-tetrahydronaphthal-  
ene, A., 941.
- 2:6-Di-*sec*-butyl-1:3:5:7-tetraketopyrazo-  
(1:2-α)-pyrazole, A., 1143.
- Dibutylthallium acetylacetone, A., 1269.
- Dibutylthiocarbamic acid, ferric salt, A.,  
795.
- Dibutyric acids, α-thio-, A., 499.
- Di-(α-carbamido-ββ-trichloroethyl) ether,  
and its derivatives, A., 151.
- Dicarbamylputrescine, and its dipicrate, A.,  
545.
- Di-(5-carbethoxy-3-β-carboxyethyl-2-  
pyrrol)methane, *di-o*-bromo-, and its di-  
methyl ester, A., 281.
- 5:5'-Dicarbethoxy-3:3'-di-(ββ-dicarbethoxy-  
ethyl)-4:4'-dimethylpyrromethane, deriv-  
atives of, A., 285.
- 5:5'-Dicarbethoxy-4:4'-diethyl-3:3'-di-(ββ-  
dicarbethoxy)ethyl-2:2'-pyrromethane,  
and its sodium salt, A., 864.
- 4:4'-Dicarbethoxy-3:3'-dimethyl-5:5'-di-β-  
carboxyethylpyrromethane hydrobrom-  
ide, A., 861.
- 5:5'-Dicarbethoxy-4:4'-dimethylpyrrometh-  
ene, 3:3'-dichloro-, A., 1045.
- αα-Di-(4-carbethoxy-3:5-dimethyl-2-pyrrol)-  
propane, A., 1263.
- pp*'-Dicarbethoxydiphenylcarbodi-imide, A.,  
840.
- 3-(ββ-Dicarbethoxy)ethyl-2:4-dimethylpyr-  
role-5-carboxylic acid, derivatives of, A.,  
285.
- Di(5-carbethoxy-4-methyl-3-β-carboxyethyl-  
2-pyrrol)methane, derivatives of, A., 285.
- 3:5-Dicarbethoxy-4-methyl-2-pyrrolacetald-  
oxime, A., 861.
- 3:5-Dicarbethoxy-4-methyl-2-pyrrolaceto-  
nitrile, A., 861.
- 2:4-Dicarbethoxyphloroglucinaldehyde, A.,  
1141.
- γ-2:3-Dicarbethoxypiperidinobutyric acid,  
ethyl ester, A., 178.
- 5:8-Dicarbethoxy-1:4:6:7-tetramethyl-2:3-di-  
β-carboxyethylporphin, and its tetra-  
methyl ester, A., 1263.
- 3:3'-Dicarbethoxy-4:5:4':5'-tetramethyl-  
pyrromethane, and its copper salt, A.,  
173.
- Dicarbocyanines, A., 282.
- Dicarbomethoxyresorcylic alcohols, and their  
derivatives, A., 380.
- Dicarbomethoxythioacetallylamide, A., 758.
- Dicarbonyl-*o*-phenanthroline, ferrous com-  
pounds of, A., 134.
- Di-(κ-carboxydecyl)acetamide *p*-thioarsen-  
ite, A., 408.
- Di-(κ-carboxydecyl)benzamide *p*-thioarsen-  
ite, A., 408.
- 3:3'-Dicarboxydiphenyl-4:4'-diarsinic acid,  
derivatives of, A., 1148.
- Dicarboxy-3:3'-dipyridyl disulphides, A.,  
1039.
- Dicarboxy-3:3'-dipyridyl-3-sulphonic acids,  
A., 1039.
- 3:3'-Di-β-carboxyethylpyrromethane,  
4:5:4':5'-tetrabromo-, and its hydrobrom-  
ide, A., 282.
- 3:4'-Di-β-carboxyethyl-4:3':5'-trimethyl-  
pyrromethane, 5-hydroxy-, A., 1045.
- Di-(5-carboxy-4-methyl-3-ethyl-2-pyrrol)-  
methane, condensation product of, with  
acetone, and its derivatives, A., 1263.
- αα-Di-5-carboxy-3-methylphenylbutane,  
ββγ-trichloro-αα-di-4-hydroxy-, A., 849.
- 1:5-Di-*o*-carboxyphenylantraquinone, and  
its dimethyl ester, A., 400.
- Dichromic acid. See under Chromium.
- 5:7-Dicinnamoyloxy-2-styrylchromone, A.,  
520.
- Dicoumarin, derivatives of, A., 861.
- ψ-Dictamnine, synthesis of, A., 289.

- pp'*-Dicumylidenedihydrazino-*p''*-isopropyl-triphenylmethane, A., 159.
- Dicyanodiamide, as a fertiliser, B., 618.
- Didehydrostrychnidine, A., 179.
- Didehydrotetrahydrostrychnine, A., 179.
- Didehydrovomisine, A., 179.
- anti*-Diperidibenzocoronene, synthesis of, and its salts, A., 731.
- 3:3'-Di(diethylamino)diphenyl, A., 508.
- Di-*p*-diethyldiaminodiphenyl-8-aldehyde-1-naphthylcarbinol, A., 1250.
- Di-*p*-diethylanilino-germanic anhydride, A., 866.
- 3:3'-Di-(3:4-dimethoxyphenyl)-4:4'-dicoumarin, A., 861.
- 3:3'-Di(diethylamino)diphenyl, A., 508.
- 2:2'-Di(*p*-dimethylaminophenyl)benzobisthiazole, A., 68.
- Di- $\beta$ -*p*-dimethylaminophenylethyl ketone, and its semicarbazone, A., 59.
- 1:5-Dimethylbenzoylanthraquinones, A., 617.
- $\delta\delta$ -Di-(dimethyl- $\beta$ -carboxyethyl-2-pyrryl)- $\beta\zeta$ -dimethyl- $\Delta\beta$ -heptadiene, A., 1263.
- Di-(dimethylethyl-2-pyrryl)diketones, A., 285.
- $\delta\delta$ -Di-(3:5-dimethyl-4-ethyl-2-pyrryl)- $\beta\zeta$ -dimethyl- $\Delta\beta$ -heptadiene, A., 1263.
- Di-( $\alpha\beta$ -dimethyl)propyl ethers, *di*(*di*- $\beta$ -hydroxy)-, A., 363.
- Di-(3:5-dimethyl-2-pyrryl)diketone, A., 285.
- 3:9-Di-(diphenylmethyl)perylene, 3:9-*di*- $\alpha$ -hydroxy-, A., 1035.
- Didiphenyl ethers, A., 1126.
- 3:3'-Didiphenyl sulphide, 6:6'-*di*hydroxy-, A., 844.
- Di- $\beta$ -diisopropylidene-fructosephosphoric acid, esters of, A., 1238.
- Di-2:2'-dithienylarsenious oxide, A., 630.
- Di-*n*-dodecylmalonamide, A., 371.
- Di-*n*-dodecylmalonic acid, A., 720.
- s*-Di-*n*-dodecylloxamide, A., 371.
- Di-*isoduryloyl*methane, *mono*- and *di*-bromo-, and *mono*- and *di*-chloro-, A., 1133.
- Dielectric constants, Clausius-Mossotti law for, A., 676.
- measurement of, A., 676.
- apparatus for, A., 214.
- by the oscillatory circuit method, A., 561.
- relation of, to optical properties, A., 899.
- relation of surface molecular potential and, A., 224.
- and phase-boundary potentials, A., 1000.
- effect of magnetic fields on, A., 1077.
- variation of, with temperature, A., 1190.
- of colloids, A., 462.
- of colloidal solutions, A., 462.
- of diluted strong electrolytes, relation of, to frequency, A., 322.
- of liquids, A., 9, 214, 322, 560, 794.
- of binary mixed liquids, A., 110.
- of oxides, A., 560.
- of organic dipole-free substances, A., 561.
- of organic liquids, A., 447.
- of salts, A., 560.
- and power factors of solids, A., 561.
- of thixotropic systems, A., 572.
- Dielectric liquids, purification of, (P.), B., 734.
- conductivity of, A., 321, 914, 983.
- association in, A., 1080.
- Dielectric materials, (P.), B., 515, 646.
- impregnation of, in vacuo, (P.), B., 28.
- determination of, in fibrous materials, (P.), B., 433.
- Dielectrics, power factor and loss in, B., 685.
- for condensers, (P.), B., 353.
- organic, acid-resistivity of, B., 432.
- Diemictylus pyrrhogaster*, glycogen distribution in, A., 1154.
- Diene-carboxylic acids, formation of aromatic hydrocarbons from, A., 258.
- Diet, requirements of, for fertility and lactation, A., 1069.
- principle in, stimulating growth and lactation, A., 1174.
- effect of, on acetylation, A., 772.
- accessory factors in, A., 973.
- value of calcium and phosphorus in, A., 87.
- in India, calcium content of, A., 963.
- of children, iron and vitamin-*B*<sub>1</sub> in, A., 876.
- for rats bred for tests on vitamins, A., 886.
- acid, effect of, on nitrogen excretion, A., 300.
- calcium-deficient, effect of lime and cod-liver oil on sheep fed on, A., 962.
- carbohydrate-free, metabolism of animals on, A., 199.
- fat-free, deficiency disease from, A., 646.
- for rats, deficiency of, A., 972.
- low-protein, nitrogen equilibrium on, A., 418.
- effect of, on young rats, A., 1060.
- on gestation and the oestrous cycle, A., 1060.
- manganese-free, oestrous cycle in rats on, A., 1283.
- milk, growth and reproduction on, A., 421.
- male sterility on, A., 435.
- rachitogenic, effect of, on thyroid in rats, A., 1159.
- simplified, reproduction and lactation on, A., 434.
- vegetarian, value of, A., 1160.
- whole-milk, addition of meat to, A., 1161.
- Dietetic preparations, production of, (P.), B., 912.
- Diethoxyacetic acid, ethyl ester, action of alkoxides on, A., 363.
- 3:4-Diethoxybenzaldehyde, A., 1034.
- 3:4'-Diethoxybenzil, 2-chloro-, A., 1034.
- 3:4-Diethoxybenzonitrile, A., 1034.
- 3:4-Diethoxybenzoyl- $\alpha$ -chlorophenylcarbinol, and its oxime, A., 1034.
- s*-Di-( $\alpha$ -ethoxy- $\beta\beta$ -tribromoethyl)carbamide, A., 1114.
- 3:19-Diethoxy-6:9-dihydro-5:22-*di*hydroxy-acriquinolines, A., 754.
- 2:2'-Diethoxydiphenyls, 3:5:3':5'-*tetra*nitro-, A., 267.
- 3:3'-Diethoxydiphenyl, 4:4':6:6'-*tetra*nitro-, A., 508.
- 4:4'-Diethoxydiphenyl, 2:2'-*dinitro*-, A., 52.
- s*-Di-( $\alpha$ -ethoxyethyl)carbamide, *di*- $\beta\beta$ -tribromo-, A., 151.
- $\beta\delta$ -Diethoxy- $\Delta\gamma$ -hexinenes,  $\alpha\zeta$ -*di*bromo-, and their dibromo-derivatives, A., 928.
- 3:4'-Diethoxyphenyl- $\alpha$ -chlorobenzyl ketone, and its *anti*-oxime, A., 1034.
- Di-*p*-ethoxyphenylselenium *di*hydroxide and its salts, A., 70.
- Diethyl ether, *di*(tribromo)- and  $\beta\beta$ -tribromo- $\beta'$ -hydroxy-, A., 367.
- fluorophosphate, A., 1233.
- hydrogen and sodium phosphites, A., 937.
- sulphide,  $\beta\beta'$ -*dichloro*-, manufacture of, B., 330.
- vapour pressure of, A., 454.
- sulphoxide,  $\alpha\alpha'$ - $\beta\beta'$ -*tetra*bromo-, A., 1233.
- $\beta\beta'$ -*di*hydroxy-, A., 529.
- 7:8-Diethylacenaphthene, 3-bromo-7:8-*di*hydroxy-, and its dehydration, A., 1246.
- Diethylacetylaminide chloroplatinate, A., 727.
- Diethylacetamidine hydrochloride, A., 727.
- Diethylacetylhexylamidine, and its hydrochloride, A., 727.
- Diethylamine, reaction of, with ethylcinnamate, A., 1246.
- with ethyl crotonate, A., 600.
- with ethylene oxide, A., 935.
- with methyl acetylenedicarboxylate, A., 727.
- compound of, with ferric inositolphosphate, A., 1127.
- with phenylboric acid, A., 836.
- Diethylamine,  $\beta\beta'$ -*dichloro*-, salts of, A., 256.
- Diethylamines,  $\beta\beta'$ -*dihalogeno*-, A., 256.
- Diethylaminobarbituric acid, 5-bromo-, A., 283.
- 4-Diethylaminobenzophenone, 4'-bromo-, A., 386.
- p*-Diethylaminobenzophenone, and 2'-chloro- and nitro-, and their oximes, A., 386.
- $\beta$ -Diethylaminobutyric acid, A., 600.
- $\gamma$ -Diethylamino- $\alpha\alpha$ -diethylbutyronitrile, A., 727.
- $\beta$ -Diethylamino- $\alpha\alpha$ -dimethylpropaldehyde, and its semicarbazone, A., 504.
- $\gamma$ -Diethylamino- $\beta\beta$ -dimethylpropyl alcohol, and its derivatives, A., 504.
- 3:3'-Diethylaminodiphenyl, A., 508.
- $\beta$ -( $\beta\beta'$ -Diethylaminoethoxyethoxy)ethyl alcohol, A., 935.
- $\beta$ -( $\beta$ -Diethylaminoethoxy)ethyl alcohol, and its *p*-nitrophenylurethane hydrochloride, A., 935.
- $\beta$ -Diethylaminoethyl alcohol, derivatives of, A., 935.
- $\beta$ -Diethylaminoethyl ether, and its hydrochloride, A., 844.
- $\beta$ -Diethylaminoethylpyridinium salts, A., 1042.
- 4-Diethylamino-4'-methoxybenzophenone, A., 386.
- Diethylaminomethyl alcohol, esters of, A., 845.
- 2-Diethylaminomethylcyclohexanol, and its derivatives, A., 1126.
- $\Delta^2$ -Diethylaminomethylcyclohexene, A., 1126.
- $\omega$ -Diethylaminophenetole, A., 1042.
- 5-*p*-Diethylaminophenylacridine, and 7-chloro-2-nitro-, A., 862.
- p*-Diethylaminophenyliminophthalonimide, A., 624.
- Diethylaniline, equilibrium of, with aniline and ethylaniline, A., 574.
- Diethylarsine, and its derivatives, A., 1120.
- 5:5-Diethylbarbituric acid, reaction of, with diazomethane, A., 1041.
- s*-Diethylcarbamide, *s*-*di*-( $\alpha$ -hydroxy- $\beta\beta$ -tribromo)-, and its *OO'*-diacetyl derivative, A., 1114.
- as*-Diethylcarbamide, *as*- $\beta\beta'$ -*di*hydroxy-, dibenzoyl derivative, A., 256.
- Diethylcarbinol, dehydration of, A., 1017.
- 3:4-Diethylcarbonatophenylacetic acid, 2-nitro-, A., 56.
- 1:1'-Diethyl-2:4'-carhoquinocyanine 1-iodide, A., 756.
- Diethylethane, A., 1139.
- 1:1'-Diethyldicarbocyanines, 11-bromo-, 11-chloro-, and 11-nitro-, iodides of, A., 282.
- 4:4-Diethyl-3:5-diketopyrazolidine, A., 1143.
- 1:4-Diethylene dioxide (*dioxan*), manufacture of, (P.), B., 378.
- molecular compounds of, A., 719.
- derivatives of, A., 1141.
- Diethylene dioxide, *dichloro*-, structure of, A., 949.
- tetrachloro*-derivatives, isomeric, A., 949, 1259.

- Diethylene glycol, manufacture of esters of, (P.), B., 591.
- O*-Diethylevernic acid, ethyl ester, A., 742.
- Diethylgermanium dibromide and oxide, A., 606.
- Diethylgermaniumimine, A., 606.
- N,N'*-Diethylguanidine sulphate, A., 605.
- $\gamma$  $\delta$ -Diethyl- $\Delta\alpha$ -hexadiene tetrabromide, A., 40.
- $\alpha\gamma$ -Diethylhexoic acid, and its ethyl ester, A., 142.
- $\alpha\alpha$ -Diethylhexonitrile, A., 727.
- $\alpha\gamma$ -Diethylhexyl alcohol, and its acetate, A., 142.
- 7:8-Diethylideneacenaphthene, 3-bromo-, A., 1246.
- Diethyl ketone phenylhydrazones, decomposition of, catalytically, A., 1236.
- Diethyl ketone, *di*- $\beta$ -hydroxy-, and its homologues, (P.), B., 301.
- Diethylmalonyl-*N*-phenyl-*N'*-methylthiocarbamide, A., 951.
- 1:4-Diethylnaphthalene, and its picrate, A., 512.
- 4:4'-Diethyl- $\alpha$ -naphthyl, and its dipicrate, A., 512.
- 1:1'-Diethyloxadiazocarbocyanine, 10-chloro-, iodide, A., 283.
- Diethyl-1-phenyl-3-methylbarbituric acid, A., 283.
- Diethylphosphoroyl chloride, A., 364.
- 1:4-Diethylpiperazine, 1:4-*di*- $\beta$ -amino- and 1:4-*di*- $\beta$ -isocyano-, and their salts, A., 168.
- Diethylpropionylacetone, A., 1269.
- N,N'*-Di- $\alpha$ -ethylpropyl-*p*-phenylenediamine, derivatives of, A., 154.
- 2:6-Diethyl-4-pyridone, and its salts, A., 1256.
- 2:6-Diethyl- $\gamma$ -pyrone, synthesis of, and its salts, A., 1255.
- $\beta\beta$ -Diethylstyrene, and its oxide, A., 392.
- Diethylsulphinebenzenesulphonylimine, A., 529.
- Diethylsulphine-*p*-toluenesulphonylimine,  $\beta\beta'$ -*di*hydroxy-, A., 529.
- 2:6-Diethyl-1:3:5:7-tetraketopyrazo-(1:2- $\alpha$ )-pyrazole, A., 1143.
- Diethylthiocarbamic acid, esters of, A., 509.
- 1:1'-Diethylthiodiazocarbocyanine, 10-bromo- and 10-chloro-, iodides, A., 283.
- Di-(5-ethylthio-2-thienyl)thiophen, mercury derivative, A., 752.
- l*- and *dl*-Difenchyl pyrophosphates, preparation and enzymic hydrolysis of, A., 1167.
- Diffraetic acid, and its derivatives, A., 396.
- synthesis of, and its methyl ester, A., 613.
- Diffusion, theory of, A., 13.
- on solid surfaces, A., 688.
- of colloidal particles, A., 805.
- of gases under pressure, A., 224.
- of salts in gels and of gases through membranes, A., 804.
- Diffusion apparatus, for gases, liquids, or solids, (P.), B., 1060.
- Diffusion coefficients, determination of, A., 139, 567.
- of colourless substances, relation of particle sizes and, A., 224.
- Difructofuranose anhydride, molecular structure of, A., 1117.
- Difructose anhydride, derivatives of, A., 724.
- Di- $\beta$ -furylacryloylacetone, A., 1259.
- Di- $\beta$ -furylacryloylmethane, synthesis of, A., 1259.
- 2:2'-Difuryl-5-aldehyde, and its semicarbazone, A., 1259.
- 2:2'-Difuryl-5-carboxylic acid, A., 1259.
- 2:2'-Difuryl ketone, A., 1259.
- 2:2'-Difurylmethane, A., 1259.
- 2:2'-Difurylmethane-5:5'-dialdehyde, and its derivatives, A., 1259.
- 1:3-Di-( $\beta$ 2'-furylvinyl)benzene, 4:6-dinitro-, A., 57.
- m*-Digallic acid, biological synthesis of, A., 1168.
- Digestors, lid for removal of vapours from, (P.), B., 630.
- tilting, (P.), B., 755.
- Digitalis, pharmacology and toxicology of leaves of, A., 541.
- glucosides, from leaves, A., 662.
- diuresis produced by, in the isolated kidney, A., 1163.
- cardioactive crystalline, (P.), B., 577.
- determination of, colorimetrically, A., 313.
- action of, on metabolism, A., 965.
- diuresis produced by, A., 1163.
- pharmaceutical preparations of, A., 88.
- absorption of, from intestines, A., 647.
- assay of, A., 1164.
- biological assay of, containing glycerol, B., 576.
- tinctures, evaluation of, B., 1054.
- relationship of potency and  $pH$  of, B., 447.
- assay of, A., 964.
- biological assay of, B., 576.
- tincture and fluid extract of, B., 576.
- Xenopus* for standardisation of, A., 964.
- biological assay of, A., 1284; B., 702.
- Digitalis purpurea*, fat from, B., 1125.
- 3:5-Di- $\beta$ -glucosidoxyflavylium chlorides, *di*- and *tri*-hydroxy-, A., 1141.
- Diglycerol, and its *mono*- and *di*-chlorohydrins, acetates of, A., 42.
- Diglycyldehydrophenylalanine, A., 427.
- Diglycylglycine-*N*-sulphonic acid, and its potassium salt, A., 1023.
- Di(glycyl-*l*-leucyl)glutathione, A., 762.
- Di(glycyl-*l*-leucylglycyl-*l*-leucyl)-glutathione, A., 762.
- Di-*n*-hexadecylammonium pierate, A., 685.
- Dicyclohexadiene, constitution of, and its dihydro-derivative, A., 938.
- Di-*trans*-hexahydro-2-hydrindylidenehydrazine, A., 1033.
- d*-Di-(isohexylglycyl-*l*-leucyl)glutathione, *di*- $\alpha$ -bromo-, A., 762.
- $\alpha\beta$ -Dicyclohexylethylene glycols, A., 380.
- 1:1-Dicyclohexylcyclohexanes, 1:1-*di*-*p*-hydroxy-, and their derivatives, A., 53.
- Di(cyclohexyl)malonamide, A., 371.
- Dicyclohexylmethane, 4:4'-*di*hydroxy-, and its derivatives, A., 53.
- Di(cyclohexyl)oxamide, A., 371.
- Dicyclohexylphenylsilicic acid, 1050.
- Dicyclohexylphenylsilicic chloride, A., 1050.
- Diholositides, structure of, A., 146.
- Dihomophthalimide-4-azo-*pp*'-dianisyl, A., 624.
- Dihomophthalimide-4-azo-*pp*'-diphenyl, A., 624.
- Dihomophthalimide-4-azo-*pp*'-ditolyl, A., 624.
- spiro*-5:5-Dihydantoins, optically active, and their derivatives, A., 171.
- Dihydroaloe-emodinanthranol, A., 1252.
- Dihydro- $\beta$ -amyrilene, and its oxide, A., 1254.
- Dihydro-*d*-amyrilenes, A., 517.
- Dihydroisobergaptene, A., 860.
- Dihydrobetulin, and its derivatives, A., 749.
- Dihydrobetulinolcarboxylic acid, and its derivatives, A., 1138.
- Dihydrobetulinolcarboxylic acid, and its dimethyl ester, A., 1138.
- Dihydrobetulonic acid, and its semicarbazone, A., 750.
- Dihydrobrucic acid, oximino-, nitrosamine of, A., 629.
- Dihydrobrucidine, A., 528.
- Dihydrobrucidinonic acid, and its acetyl derivative, A., 407.
- Dihydrobrucine, and its isomeride, and their derivatives, A., 629.
- 2:3-Dihydrocarbazole, A., 168.
- Dihydrocarvone, hydroxy-, A., 1139.
- Dihydrocholesterol in human brain, A., 293.
- Dihydrocholesterols, chloro-, A., 511.
- Dihydrocinchonine, rotation of, and its hydrochloride, A., 760.
- Dihydrocinchonidine, rotation of, and its dihydrobromide, A., 760.
- Dihydrocinchonine, rotation of, and its salts, A., 760.
- dihydrobromide, crystal structure of, A., 987.
- Dihydrocodeinone, 7-hydroxy-, and its oxime, and 7-oximino-, A., 953.
- 9:10-Dihydroheterocordianthrone, 9:10-*di*-hydroxy-, A., 618.
- Dihydro-de-*N*-dimethyltetrahydrooxycytisine, and its derivatives, A., 1147.
- Dihydrodeguelin, A., 950.
- Dihydrodemethylenetetrahydromethylstrychnidine, A., 629.
- Dihydro-de-*N*-methylsinomeninonefuran, 1-bromo-, and its hydrobromide, A., 1049.
- $\alpha$ -Dihydrodeoxycodone, constitution of, A., 408.
- Dihydroderitol, A., 400.
- derivatives of, A., 950.
- Dihydrodicholesteryl, dibromo-, A., 944.
- Dihydrodicoleic acid, derivatives of, A., 397.
- Dihydroelemonic acids, and their oximes, A., 1253.
- $\alpha$ -Dihydroergosterol, isomeride of, and its acetate, A., 511.
- determination of, in ergosterol from ergot, A., 511.
- Dihydroergosterol III, and its acetate, A., 381.
- Dihydrohemicytissylene, and its chloroplatinate, A., 1146.
- 6:9-Dihydro-5:22-dihydroxyacriquinolines, diamino-, acetyl derivative, and dihydroxy-, A., 754.
- $\gamma$ -3-Dihydroindolylbutyric acid, and its derivatives, A., 167.
- $\beta$ -3-Dihydroindolylpropionic acid, and its derivatives, A., 167.
- Dihydrokiganol, A., 277.
- Dihydrolumisterol, and its derivatives, A., 381.
- epi*-Dihydrolumisterol, and its derivatives, A., 381.
- Dihydrolupeol, acetate of, A., 1245.
- Dihydromarmelosin, and its derivatives, A., 1035.
- Dihydromethoxymethyl-dihydronestrachnine, A., 527.
- Dihydro- $\gamma$ -methyltetrahydronaphtho- $\alpha$ -pyrone, A., 64.
- Dihydromyrcene, formation of, from linalolene, A., 857.
- 3:4-Dihydro-1:2-naphthacridine, 14-amino-, and its salts and derivatives, A., 523.
- 3:4-Dihydro-1:2-naphthacridine-14-carboxylic acid, salts and derivatives of, A., 523.
- $\Delta^2$ -Dihydronaphthalene, Raman spectrum of, A., 1076.

- 1:4-Dihydronaphthalene, reaction of, with arylamines, A., 1242.  
 Dihydro- $\alpha$ -naphthoindazole, and its derivatives, A., 863.  
 Dihydro- $\alpha$ -naphthoindazole-3-carboxylic acid, and its derivatives, A., 863.  
 Dihydronaphthopyrazole. See Dihydro- $\alpha$ -naphthoindazole.  
 Dihydroapomorphine, and its picrate, A., 406.  
 Dihydro-osthol, A., 751.  
 3:4-Dihydropapaverine methiodide, A., 527.  
 3:4-Dihydropapaveroline methobromide, A., 1047.  
 Dihydropentindole, derivatives of, and their bromination, A., 169.  
 5:10-Dihydrophenarsazine, 10-chloro-, and its derivatives, A., 181.  
 Dihydropimaric acid, isomer and oxides of, A., 1255.  
 Dihydropimpinellins, A., 663.  
 Dihydro-1:4-pyrans, A., 63, 279, 746.  
 Dihydroquinidine, rotation of, and its dihydrobromide, A., 760.  
 Dihydroquinine, rotation of, and its salts, A., 760.  
 Dihydroresorcinols, A., 737.  
 substituted, alkylation of, A., 737.  
 Dihydroretene, and A-thiol-, A., 943.  
 A-Dihydroretenesulphonic acid, and its sodium salt, A., 943.  
 Dihydroretenesulphonic acids, and their salts and derivatives, A., 943.  
 Dihydrorotenone, dimorphic forms of, A., 165.  
*isooxime*, A., 619.  
 acetyl derivative, A., 950.  
 Dihydrorotenonic acid, diacetyl derivative, A., 950.  
 Dihydrorubrenes, isomeric, A., 374.  
 Dihydrostrychnic acid, oximino-, nitrosamine of, A., 629.  
 Dihydrostrychnine-*p*-carboxylic acid, salts of, A., 407.  
 Dihydrothebainone, formation of (—) bromosinomeninone from, A., 290.  
 Dihydrothebainone, 7-amino-, and its oxime, A., 953.  
 9:10-Dihydrothebaine hydrochloride, A., 1049.  
 4:5-Dihydrothymine, 4:5-dihydroxy-, effect of dilute acids and of light energy on, and its anhydride, A., 523.  
 Dihydrotoxicarolic acid, and its derivatives, A., 856.  
 Dihydrotricyclopentadienes, and their dibromides, A., 938.  
*iso*Dihydrotubaic acid, A., 400.  
 4:5-Dihydrouracil-4-acetic acid, ethyl ester, A., 754.  
 Dihydrovitamin-D<sub>2</sub>, and its derivatives, A., 311.  
 Dihydrovomicine, and dinitro-, and their derivatives, A., 180.  
 Di-indene, structure of, and its oximino-derivative, A., 507.  
 Di-3-indolylphosphinic acid, and its silver salt, A., 954.  
*iso*Di-indone, dibromo-, A., 747.  
 3:4-Diketo-6-acetoxymethyltetrahydropyran 3:4-bisphenylhydrazone, A., 64.  
 4:5-Diketo-3-acetyl-1:2-di-*p*-methoxyphenylpyrrolidine, A., 171.  
 4:5-Diketo-3-acetyl-1:2-diphenylpyrrolidine *p*-tolylhydrazone, A., 171.  
 4:5-Diketo-3-acetyl-1-*o*-methoxyphenyl-2-*p*-methoxyphenylpyrrolidine, A., 171.  
 4:5-Diketo-3-acetyl-2-phenyl-1-methylpyrrolidine, and its methylhydrazone, A., 171.  
 4:5-Diketo-3-acetyl-2-phenylpyrrolidine, and its phenylhydrazone, A., 171.  
 $\alpha\alpha'$ -Diketoadipamic acid, and its amide, A., 1234.  
 $\alpha\alpha'$ -Diketoadipic acid, synthesis of, and its derivatives, A., 1234.  
 $\alpha\beta$ -Diketoadipic acid, derivatives of, A., 1247.  
 $\beta\zeta$ -Diketoazelic acid,  $\alpha$ -cyano-, ethyl ester, and its diphenylhydrazone, A., 1128.  
 $\alpha\delta$ -Diketobutane- $\alpha\beta\gamma\delta$ -tetracarboxylic acid, ethyl ester, A., 1234.  
 $\alpha\beta$ -Diketo-*n*-butyric acid, ethyl ester,  $\alpha$ -2:4:6-tribromophenylhydrazone. See Benzeneazooacetoacetic acid, 2:4:6-tribromo-, ethyl ester.  
 4:5-Diketo-1-(2':4':5'-trichlorophenyl)pyrazoline 4-(2''':4''':5'''-trichlorophenylhydrazone), A., 625.  
 4:5-Diketo-1-(2':5'-dichlorophenyl)pyrazoline-3-carboxylic acid, and its ethyl ester, 4(2''':5''':5'''-dichlorophenylhydrazones), A., 624.  
 $\beta\delta$ -Diketo- $\lambda$ -dimethyl-*n*-hexadecane, and its disemicarbazone, A., 1234.  
 2:6-Diketo-4:4-dimethyl-1:2:3:4:5:6-hexahydrobenzhydrol, 2'-amino-, acetyl derivative, A., 403.  
 $\alpha\epsilon$ -Diketodiphenyl-*p*-diphenylpentanes, and their derivatives, A., 385.  
 4:4'-Diketo-3:3'-diphenyl-5:5'-dithiazolidylmethane, 2:2'-diimino-, A., 758.  
 3:5-Diketo-1:2-diphenylpyrazolidine, condensation of, with aldehydes, A., 523.  
 $\beta\epsilon$ -Diketo-hexane,  $\delta\gamma$ -dihydroxy-, A., 835.  
 $\beta\epsilon$ -Diketo- $\alpha$ -methylsuberic acid,  $\alpha$ -cyano-, ethyl ester, and its diphenylhydrazone, A., 1127.  
 $\alpha\gamma$ -Diketones, alcoholysis and hydrolysis of, A., 1020.  
 enolic sodium derivatives, structure of, A., 254.  
 1:4-Diketo-3-(4'-nitro-2'-methylphenyl)-tetrahydrophthalazine, A., 405.  
 2:3-Diketonic acid, derivatives of, A., 866.  
 Diketonic acid, oxidation of, and its derivatives, A., 866.  
 hydrate, bromo-, and its perchlorate, A., 953.  
 $\beta\epsilon$ -Diketo-octoic acid,  $\xi$ -cyano-, ethyl ester, and its derivatives, A., 1127.  
 $\beta\gamma$ -Diketo- $\alpha$ -phenylbutane veratrylhydrazone, A., 1142.  
 2:6-Diketo-3-phenyl-1-methylpyrimidine, 4:5-diamino-, and its 5-formyl derivative, A., 525.  
 2:6-Diketo-3-phenylpyrimidine, 4:5-diamino-, and its 5-formyl derivative, A., 525.  
 Diketopiperazines, sulphonation of, A., 1022.  
 Diketopiperazine-*NN'*-disulphonic acid, and its salts, A., 1023.  
 3:5-Diketopyrazolidine derivatives, A., 523.  
 Diketopyrazolidines, alkylated, from condensation of alkylmalonic esters and hydrazine, A., 1143.  
 4:5-Diketopyrazoline, derivatives of, A., 624.  
 $\beta\epsilon$ -Diketosuberic acid, and  $\alpha$ -cyano-, derivatives of, A., 1127.  
 Diketosuccinic acid, and its derivatives, chlorophenylsazones of, A., 624.  
 Diketosuccinophenylhydrazide 2:5-dichlorophenylsazone, A., 624.  
 1:2-Diketotetrahydronaphthalene 2-phenylhydrazone, A., 863.  
 $\alpha\epsilon$ -Diketo- $\alpha\beta\epsilon$ -triphenylpentane, and its derivatives, A., 385.  
 $\beta\gamma$ -Diketo- $\alpha\alpha\gamma$ -triphenylpropane,  $\alpha$ -hydroxy-, A., 518.  
 Dilactylic acids, A., 253.  
 Dilatation coefficient of gases, A., 222.  
 Di-(*l*-leucyl)glutathione, A., 762.  
 Di-(*l*-leucylglycyl-*l*-leucyl)glutathione, A., 762.  
 Dilo oil. See *Calophyllum inophyllum*.  
 Dilution, calculations for, B., 820.  
 Dilution law, van 't Hoff's, theory of, A., 912.  
 Di-*i*-menthyl phosphates, A., 276.  
 Dimercursulphatodimercuridi(malonamide), dihydroxy-, A., 938.  
 Dimercursulphatodimercuridi(malonamide), dihydroxy-, A., 938.  
 Dimesitylbutane, A., 941.  
 Dimesitylcarbinol, and its benzoate, A., 1250.  
 Dimesityl diketone, and its oxime, A., 1250.  
 Dimesitylhexane, A., 941.  
 Dimesityl ketone, A., 1250.  
 Dimesitylmethane, A., 1250.  
 Dimethanedisulphonic acid, dithio-, and its salts, A., 1233.  
 Dimethanesulphonanilide, A., 940.  
 3:4-Dimethoxyacetophenone,  $\omega$ -amino-, and its salts and derivatives, A., 54.  
 hydrochloride, A., 391.  
 3:4-Dimethoxy-2-acetyl-*s*coumarone, A., 279.  
 5:6-Dimethoxy-2-acetyl-3-phenylindole, A., 1142.  
 2:4-Dimethoxy-6-amybenzoic acid, methyl ester, A., 521.  
 5:6-Dimethoxyanthranilcarboxylic acid, A., 56.  
 Dimethoxyanthraquinones, salts of, A., 947.  
 2:3-Dimethoxybenzaldehyde, 5-nitro-, A., 855.  
 3:4-Dimethoxybenzaldehyde, 4-hydroxy-. See Syringic aldehyde.  
 3:4-Dimethoxybenzamidine, and its salts, A., 55.  
 2:4-Dimethoxybenzeneazo- $\beta$ -naphthol, A., 1245.  
 2:4-Dimethoxybenzeneazoresorcinol, A., 1245.  
 3:4-Dimethoxybenziminooether hydrochloride, A., 55.  
 2:3-Dimethoxybenzoic acid, 5-amino- and 5-nitro-, A., 855.  
 dibromo-, A., 1047.  
 4:5-Dimethoxybenzoic acid, 2-hydroxy-, and its derivatives, A., 383.  
 Dimethoxybenzophenones, A., 390.  
 $\beta$ -3:4-Dimethoxybenzoyl- $\alpha\beta$ -dimethylpropionic acid, A., 735.  
 Dimethoxybenzoyloxybenzaldehydes, A., 1031.  
 Dimethoxybenzoyloxybenzoic acids, A., 1031.  
 6:7-Dimethoxy-1-(3'-benzyloxy-4'-methoxy)-benzylisoquinoline, and its salts, A., 175.  
 $\delta$ -Di-( $\alpha$ -methoxy- $\beta\beta\beta$ -tribromoethyl)carbamide, A., 1114.  
 2':5'-Dimethoxyamphoranilic acid, A., 1253.  
 (5:6-Dimethoxy-2-carbethoxy-3-indolyl)-butyric acid, ethyl ester, A., 1142.  
 1:3-Dimethoxycarbostyryl, A., 384.  
 4:5-Dimethoxy-2-carboxymethoxybenzoic acid, and its dimethyl ester, A., 860.  
 6:7-Dimethoxy-1-(3'-carboxy-1':2':2'-trimethylcyclopentyl)-3:4-dihydroisoquinoline, A., 1262.  
 3:5-Dimethoxy-2- $\alpha\beta$ -trichloropropylphthalide, 4-hydroxy-, and its acetate, A., 849.  
 5:7-Di-*p*-methoxycinnamoyloxy-4'-methoxy-2-styrylchromone, A., 520.

- 3:4-Dimethoxycinnamylideneacetophenone, 2-hydroxy-, A., 520.
- 6:7-Dimethoxy-3'-4'-diethylcarbonato-1-benzyl-3:4-dihydroisoquinoline, 2'-nitro-, and its methiodide, A., 69.
- 2:2'-Dimethoxy-5:5'-diformyldiphenyl ether, and its dioxime, A., 175.
- 3':5'-Dimethoxy-3:5-di- $\beta$ -glucosidoxylavium chloride, 7:4'-dihydroxy-, A., 1141.
- Dimethoxy-6:9-dihydro-5:22-dihydroxyacriquinolines, A., 754.
- 5:6-Dimethoxy-2-(3':4'-dimethoxy-6'-ethylphenyl)-1-methyldihydroindole, A., 527.
- 5:6-Dimethoxy-2-(3':4'-dimethoxy-6'-vinylphenyl)-1-methyldihydroindole, A., 527.
- 5:4:4'-Dimethoxy-4''':4''''-dimethylbenzpinacol, A., 515.
- 3:4-Dimethoxy-6:3'-dimethylchalcone, 2-hydroxy-, A., 388.
- Di-(5-methoxy-1:3-dimethyl-2-indolinone-3- $\beta$ -ethyl)amine, A., 759.
- 6:7-Dimethoxy-2:3-dimethylnaphthalene, and its picrate, A., 735.
- 2:2'-Dimethoxydiphenyl, 4:4':6:6'-tetranitro-, A., 729.
- 2:2'-Dimethoxydiphenyl ether, 5:5'-dinitro-, A., 175.
- 2:4-Dimethoxydiphenyl, 4'-fluoro-2':5'-dinitro-, A., 729.
- 3:3'-Dimethoxydiphenyl, 4:4':6:6'-tetranitro-, A., 508.
- 4:4'-Dimethoxydiphenyl 3:3'-diacetate, 2:2'-dichloro-3:6:3':6'-tetrahydroxy-, A., 853.
- 6:6'-Dimethoxydiphenyl, 2:2'-difluoro-, and its diacetyl derivative, A., 945.
- Dimethoxydiphenylacetaldehydes, and their semicarbazones, A., 390.
- 5:4:4'-Dimethoxy-4''':4''''-diphenylbenzpinacol, A., 515.
- 2:2'-Dimethoxydiphenyl-3-carboxylic acid, A., 1121.
- 2:5-Dimethoxydiphenyl-6'-carboxylic acid, and its salts, A., 945.
- 6:6'-Dimethoxydiphenyl-3:3'-dicarboxylic acid, 2:2'-difluoro-, and its salts, A., 945.
- 3:3-Dimethoxydiphenylene 4:4'-distibinous oxide, A., 867.
- 4:4'-Dimethoxy-2:2'-diphenylene oxide-3:6'-quinone, 5-hydroxy-, A., 853.
- 4:4'-Dimethoxydiphenyl-2':5'-quinone, 2:5-dihydroxy-, and its oxidation derivative, A., 853.
- 4:4'-Dimethoxydiphenylsulphone, 3:3'-dichloro-, A., 378.
- Dimethoxydiisopropylidenequinamide, A., 849.
- 3:4-Dimethoxy-6-ethoxyacetophenone, 2-hydroxy-, A., 64.
- Dimethoxy-2-ethoxytriphenylcarbinols, A., 613.
- 5-Di-( $\alpha$ -methoxyethyl)carbamide, di- $\beta\beta\beta$ -trichloro-, A., 151.
- Dimethoxyflavanones, A., 620.
- Dimethoxyflavones, A., 620.
- 5:7-Dimethoxyflavylium perchlorate, 4'-amino-, A., 750.
- 2:2'-Dimethoxy-5-formyl-5'-carboxydiphenyl ether, A., 175.
- 6:7-Dimethoxy-1-(3'-hydroxy-4'-methoxy)-benzylisoquinoline, A., 175.
- 5:6-Dimethoxyindole derivatives, preparation of, A., 1142.
- 3':4'-Dimethoxy-6'-methylchalcone, 2-hydroxy-, A., 388.
- 7:4'-Dimethoxy-8-methylflavylium salts, A., 852.
- 5:6-Dimethoxy-1-methylindolyl 2-sulphite, sodium derivative, A., 402.
- 6:7-Dimethoxy-1-methylnaphthalene, and its picrate, A., 735.
- 5:6-Dimethoxy-1-methyloxindole, A., 402.
- Di-4-methoxy-3-methylphenylselenium hydroxide, and its salts, A., 70.
- 6:7-Dimethoxy-2-methylquinoline, synthesis of, and its salts, A., 628.
- 1:4-Di-( $\beta$ -6'-methoxy-2'-methyl-4'-quinolylaminoethyl)piperazine tetrahydrochloride, A., 168.
- Dimethoxy-2-methyltriphenylcarbinols, A., 613.
- 3:4-Dimethoxyphenylacetanilide, A., 56.
- 3:4-Dimethoxyphenylacetic acid, 6-nitro-, benzyl ester, A., 69.
- 2:4-Dimethoxyphenylbenzylglycollic acid, A., 859.
- Dimethoxyphenyl benzyl ketones, and their derivatives, A., 392.
- 2:4-Dimethoxyphenyl benzyl ketones, A., 859.
- 2-(2':4'-Dimethoxyphenyl)-3-benzylquinoxaline, A., 859.
- 3:4-Dimethoxyphenylbutyric acid, and its 2-bromo-derivative, A., 735.
- 2':5'-Dimethoxy-N-phenylcamphorimide, A., 1253.
- 2:4-Dimethoxyphenyl  $\beta$ -chloro- $\alpha$ -hydroxy- $\beta$ -phenylethyl ketone, A., 859.
- 2:4-Dimethoxyphenyl  $\alpha\beta$ -diformoxy- $\beta$ -phenylethyl ketone, A., 859.
- $\beta$ -3:4-Dimethoxyphenylethylamine, derivatives of, A., 843.
- $\beta$ -3:4-Dimethoxyphenylethylamine,  $\beta$ -hydroxy-, and its derivatives, A., 55.
- $\omega$ -3:4-Dimethoxyphenylethylamine hydrochloride, A., 506.
- Dimethoxy- $\beta$ -phenylethylamines, A., 1126.
- $\beta$ -3:4-Dimethoxyphenylethylcamphoramic acid, A., 1262.
- 1- $\beta$ -3':4'-Dimethoxyphenylethylhydrazine, A., 1262.
- Dimethoxy- $\beta$ -phenylethylmethylenamines, and their salts, A., 1126.
- 1- $\beta$ -3':4'-Dimethoxyphenylethylnorhydrastinine, and its methiodide, A., 1262.
- 2:4-Dimethoxyphenyl  $\alpha$ -hydroxy- $\beta$ -acetoxy- $\beta$ -phenylethyl ketone, A., 859.
- 2:4-Dimethoxyphenyl  $\alpha$ -hydroxy- $\beta$ -ethoxy- $\beta$ -phenylethyl ketone, A., 859.
- 2:4-Dimethoxyphenyl  $\alpha$ -hydroxy- $\beta$ -formoxy- $\beta$ -phenylethyl ketone, A., 859.
- 2:4-Dimethoxyphenyl  $\alpha$ -hydroxy- $\beta$ -methoxy- $\beta$ -phenylethyl ketone, A., 859.
- 2:4-Dimethoxyphenyl  $\alpha$ -hydroxy- $\beta$ -methoxy- $\beta$ -phenylethyl ketone, A., 859.
- 5:6-Dimethoxy-3-phenylindole-2-carboxylic acid, and its ethyl ester, A., 1142.
- 2:4-Dimethoxyphenyl  $p$ -methoxybenzylglycollic acid, A., 860.
- 2:4-Dimethoxyphenyl  $p$ -methoxybenzyl ketones, A., 859.
- 2-(2'-4'-Dimethoxyphenyl)-3- $p$ -methoxybenzylquinoxaline, A., 859.
- 2:4-Dimethoxyphenyl  $p$ -methoxystyryl ketone, A., 859.
- $\beta$ -2:4-Dimethoxyphenylpropionamide, A., 1126.
- $\beta$ -3:4-Dimethoxyphenylpropionhydrazide, A., 1040.
- $\beta$ -2:5-Dimethoxyphenylpropionic acid, and its amide, A., 1126.
- Di-4-methoxyphenylselenium dihydroxide, di-3-bromo-, and its salts, A., 70.
- 2':4'-Dimethoxyphenyl styryl ketone, 2-hydroxy-, A., 621.
- 3:4-Dimethoxyphenylthioacetmethylamide, A., 843.
- 3:5-Dimethoxyphenylthiocarbimide, A., 154.
- $\beta$ -3:4-Dimethoxyphenylthiopropiondimethylamide, A., 843.
- Dimethoxyphenylthiourethanes, A., 154.
- $\alpha$ -3:5-Dimethoxyphenyl- $\beta$ - $p$ -tolylthiocarbamide, A., 154.
- 4:4'-Dimethoxy-4''-phenyltriphenylmethane, A., 515.
- 5:6-Dimethoxyphthalidecarboxylanilide, A., 262.
- 6:7-Dimethoxy-1- $\beta$ -piperonyl ethyl-3:4-dihydroisoquinoline, and its salts, A., 1262.
- 6:7-Dimethoxy-1- $\beta$ -piperonyl ethyl tetrahydroisoquinoline, and its picrate, A., 1262.
- 2:6-Dimethoxypyrimidine, 4-chloro-, rearrangement of, A., 404.
- 4:6-Dimethoxypyrimidine, 2-amino-, A., 404.
- 1:3-Di- $p$ -methoxystyrylbenzene, 4:6-dinitro-, A., 57.
- 3:3'-Di- $p$ -methoxystyrylbenzodifuran, A., 860.
- 3':4'-Dimethoxy-2-styrylchromone, A., 520.
- 7:8-Dimethoxy-2-styrylchromone, A., 520.
- Di-(3-methoxystyryl)ketones, di-(bromo-4-hydroxy)-, A., 513.
- 2-(3':4'-Dimethoxystyryl)-3-methyl-1:4- $\alpha$ -naphthapyrone, A., 520.
- 2-(3':4'-Dimethoxystyryl)-1:4- $\alpha$ -naphthapyrone, A., 520.
- 2:10-Dimethoxy-7:8:13:14-tetrahydroprotoberberine, 3:9-dihydroxy-, A., 177.
- 2:5-Dimethoxy-2:3:4:5-tetraphenyl-2:5-dihydrofuran, A., 63.
- $\alpha$ -2:5-Dimethoxy-2:3:5:6-tetraphenyldioxan, A., 63.
- 1:7-Dimethoxythioxanthone, and its salts, A., 860.
- Dimethyl ether. See Methyl ether.
- fluorophosphate, A., 1233.
- Dimethylalloxantin, preparation of, A., 625.
- 3:5-Dimethyl-2-allylcyclohexanone, 2-cyano-, A., 744.
- Dimethylamine, thermal decomposition of, A., 1002.
- 6-Dimethylamino-6'-aldehyde-3:4:3':4'-tetramethoxystilbene, A., 1047.
- 2-( $p$ -Dimethylaminoanil)-6-acetamidquinoline methochloride, A., 623.
- 1- $m$ -Dimethylaminoamino- $\beta$ -naphthol, A., 379.
- 2-( $p$ -Dimethylaminoanil)-6-lactamidquinoline methochloride, A., 623.
- 2-( $p$ -Dimethylaminoanil)quinolinecarboxyethylamides, and their salts, A., 522.
- 2-( $p$ -Dimethylaminoanil)quinolinecarboxylamides, and their salts and trypanocidal action, A., 522.
- 2-( $p$ -Dimethylaminoanil)quinoline-3-carboxylic acid, derivatives of, A., 523.
- 2-( $p$ -Dimethylaminoanil)quinolinecarboxylmethylamides, and their salts, A., 522.
- Dimethylaminoazobenzene, salt formation by trichloroacetic acid and, in indifferent media, A., 22.
- $m$ -Dimethylaminobenzaldehyde  $p$ -nitrophenylhydrazine, A., 384.
- $p$ -Dimethylaminobenzaldehyde, condensation of, with its phenylhydrazine, A., 159.
- 4-Dimethylaminobenzophenone, 2'-chloro-, A., 386.
- $p$ -Dimethylaminobenzophenones, and 4'-bromo-, and their oximes, and nitro-, A., 386.
- 4'-Dimethylaminobenzophenone-2-sulphonic acid, and its salts, A., 386.
- $p$ -Dimethylaminobenzoyl- $m$ -chlorophenylcarbinol oxime, A., 1034.
- $p$ -Dimethylaminobenzoyl-3:4-methylenedioxyphenylcarbinol, and its derivatives, A., 1034.
- $p$ -Dimethylaminobenzoylphenylcarbinol, structure of, and its oxime, A., 746.



- m*-Dimethylaminobenzylamine, and its salts, A., 384.
- 5-*p*-Dimethylaminobenzylhydrouacil, A., 60.
- 6-(*p*-Dimethylaminobenzylideneamino)-2-(*p*-dimethylaminophenyl)benzthiazole-5-thiosulphuric acid, A., 68.
- p*-Dimethylaminobenzylideneneobilirubin acid, A., 627.
- p*-Dimethylaminobenzylidenebisdi-indone, A., 1252.
- p*-Dimethylaminobenzylidenedeoxybenzoin, ketimine of, A., 60.
- pp'*-4:4'-Dimethylaminobenzylidenedihydrazino-*p''*-dimethylaminotriphenylmethane, A., 159.
- p*-Dimethylaminobenzylidene ketones, A., 59, 60.
- m*-Dimethylaminobenzylidonebenzylamine, A., 384.
- $\alpha$ -*p*-Dimethylaminobenzylpropionic acid,  $\beta$ -amino-, and its copper salt, A., 60.
- $\alpha$ -Dimethylamino- $\alpha$ -benzylpropionone picrate, A., 854.
- p*-Dimethylamino- $\alpha$ -cyanocinnamic acid, and its salts and ethyl ester, A., 60.
- $\alpha$ -Dimethylaminodeoxybenzoin, and its hydrochloride, A., 854.
- $\gamma$ -Dimethylamino- $\beta$ -dimethylaminomethylpropyl alcohol, and its derivatives, A., 503.
- 6-Dimethylamino-2-(*p*-dimethylaminophenyl)benzthiazole, methiodides of, A., 67.
- $\beta$ -Dimethylamino- $\alpha\alpha$ -dimethylpropaldehyde, and its salts and derivatives, A., 503.
- $\beta$ -Dimethylamino- $\alpha\alpha$ -dimethylpropionic acid, and its derivatives, A., 503.
- $\gamma$ -Dimethylamino- $\beta$ -dimethylpropyl alcohol, and its salts, A., 503.
- 3:3'-Dimethylaminodiphenyl, A., 508.
- 4'-Dimethylamino-10:10-diphenylanthrone, 1:8-dichloro-, A., 395.
- $\omega$ -Dimethylamino- $\omega$ -halogenbenzylacetophenones, and *p*-bromo-, A., 262.
- 4-Dimethylaminohydroxybenzophenone, A., 386.
- 1-Dimethylaminomaltose, salts of, A., 835.
- 4-Dimethylaminomethoxybenzophenones, A., 386.
- $\omega$ -Dimethylamino- $\omega$ -methoxybenzylacetophenone, and *p*-bromo-, A., 262.
- $\beta$ -Dimethylaminomethylisocamyl alcohol, and its derivatives, A., 504.
- $\omega$ -Dimethylamino- $\omega$ -methylbenzylacetophenones, and *p*-bromo-, A., 262.
- Dimethylaminomethyl benzyl ketone hydrobromide, A., 1239.
- $\alpha$ -Dimethylaminomethyl-*n*-butaldehyde, and its hydrochloride, A., 503.
- $\beta$ -Dimethylaminomethylbutyl alcohol, and its derivatives, A., 504.
- 4'-Dimethylamino-3:4-methylenedioxybenzil, A., 1034.
- Dimethylaminomethyl ethyl ketone *p*-bromophenacyl bromide, A., 1239.
- $\alpha$ -Dimethylaminomethylhexahydrobenzaldehyde, and its derivatives, A., 504.
- $\beta$ -Dimethylaminomethylhexahydrobenzil alcohol, and its derivatives, A., 504.
- $\alpha$ -Dimethylaminomethyl- $\alpha$ -hydroxymethylisovaleraldehyde, A., 504.
- $\alpha$ -Dimethylaminomethylpropaldehyde, A., 503.
- $\beta$ -Dimethylaminomethylpropyl alcohol, and its derivatives, A., 504.
- $\alpha$ -Dimethylaminomethylisovaleraldehyde, and its derivatives, A., 504.
- $\omega$ -Dimethylamino- $\omega$ -nitrobenzylacetophenones, and *p*-bromo-, A., 262.
- $\omega$ -Dimethylamino- $\omega$ -phenylacetophenone picrate, A., 854.
- 4'-Dimethylamino-2-phenylacenaphthiminazole, A., 286.
- 5-*p*-Dimethylaminophenylacridine, 2-nitro-, A., 862.
- 9-*p*-Dimethylaminophenylacridine, 3-chloro-, A., 754.
- Dimethylaminophenylbenzthiazoles, and 6-amino-, and their methiodides, A., 67.
- $\alpha$ -*p*-Dimethylaminophenylbutane, and its perchlorate, A., 59.
- Dimethylamino- $\alpha$ -phenylbutanes, salts of, A., 854.
- $\delta$ -*p*-Dimethylaminophenylbutan- $\beta$ -ol, and its acetate, A., 59.
- $\beta$ -Dimethylamino- $\alpha$ -phenyl- $\Delta\gamma$ -butylene picrate, A., 854.
- anti*-4'-Dimethylaminophenyl-*m*-chlorobenzyl ketoxime, A., 1034.
- p*-Dimethylamino- $\alpha$ -phenylcinnamic acid, and its nitrile and nitrile salts, A., 60.
- p*-Dimethylaminophenyl 4-diphenyl ketone, and its derivatives, A., 1028.
- $\beta$ -*p*-Dimethylaminophenylethyl *p*-dimethylaminostyryl ketone, and its semicarbazone, A., 59.
- $\beta$ -*p*-Dimethylaminophenylethyl methyl ketone, and its semicarbazone, A., 59.
- $\beta$ -*p*-Dimethylaminophenylethyl 8-phenylbutyl ketone, and its semicarbazone, A., 60.
- $\beta$ -*p*-Dimethylaminophenylethyl  $\zeta$ -phenyl hexyl ketone, and its hydrogen oxalate, A., 60.
- 2-Dimethylamino-1-phenylcyclohexan-1-ol, and its salts, A., 395.
- p*-Dimethylaminophenyliminophthalonimide, A., 624.
- 4'-Dimethylaminophenyl 3:4-methylenedioxybenzil ketone, and its *antioxime*, A., 1034.
- 2-Dimethylamino-1-phenyl-4-methylcyclohexan-1-ol, and its salts, A., 395.
- $\beta$ -Dimethylamino- $\alpha$ -phenylpropane methopicate, A., 1239.
- $\alpha$ -Dimethylaminopropiophenone picrate, A., 845.
- 2-Dimethylaminopyridine, reaction of aldehydes with, A., 167.
- p*-Dimethylaminostyryl methyl ketone, and its derivatives, A., 59, 60.
- 2-(*p*-Dimethylaminostyryl)quinolinecarboxyethylamides, and their salts, A., 523.
- 2-(*p*-Dimethylaminostyryl)quinolinecarboxylamides, and their salts and tripanocidal action, A., 522.
- 2-(*p*-Dimethylaminostyryl)quinoline-3-carboxylic acid, derivatives of, A., 523.
- 2-(*p*-Dimethylaminostyryl)quinoline carb-oxymethylamides, and their salts, A., 522.
- Dimethylaminosulphonanilide, A., 261.
- 6-Dimethylamino-3:4:3':4'-tetramethoxy-6'-ethyl- $\alpha\beta$ -diphenylethane, A., 527.
- 6-Dimethylamino-3:4:3':4'-tetramethoxyethylstilbene, A., 527.
- 6-Dimethylamino-3:4:3':4'-tetramethoxy-6'-vinylstilbenes, A., 527, 1047.
- p*-Dimethylaminotriphenylcarbenium perchlorate, A., 1127.
- p*-Dimethylaminotriphenylcarbinol, A., 733.
- p*-Dimethylaminotriphenylmethylamine, A., 733.
- 6-Dimethylaminoveratraldehyde, A., 1047.
- Dimethyl-*n*-amylarsine chloromercurate, A., 1120.
- Dimethyl-*tert*-amylcarbinol, dehydration of, A., 1232.
- Dimethylanhydroglucose, A., 1237.
- Dimethylaniline, manufacture of, (P.), B., 138.
- Dimethylaniline, methylenesulphate, A., 251.
- Dimethylaniline,  $\alpha$ -chloro-, nitration of, and its picrate, and 2-chloro-4:6-dinitro-, A., 1025.
- 5-Dimethylanilinoacridine, 3-chloro-, A., 169.
- 2:4-Dimethyl-3-anilino cyanomethylpyrrole-5-carboxylic acid, ethyl ester, A., 626.
- Di-*p*-methylanilinogermanic anhydride, A., 866.
- Dimethyl-*p*-anisidine, nitration of, and nitro-, and their salts, A., 842.
- 1:4-Dimethylantracene, 5:8-dichloro-, A., 1135.
- Dimethylanthranyl 9-methyl ethers, and 10-bromo-, A., 745.
- 1:4-Dimethylantraquinone, 5:8-dichloro-, A., 1135.
- 2:6-Dimethylantraquinone, 1:5-dichloro-, A., 1136.
- 1:5-dicyano-, A., 618.
- 3:4-Dimethylantraquinone, 2-chloro-, A., 1232.
- 2:6-Dimethylantraquinone-1-carboxylic acid, A., 1136.
- 2:6-Dimethylantraquinone-1:5-dicarboxylic acid, A., 618.
- 1:4-Dimethylantrone, 5:8-dichloro- and 5:8-dichloro-10-bromo-, A., 1135.
- Dimethylazobenzenes, amino-, and their derivatives, *o*-bisazo-dyes from, A., 264.
- 4-oximinoamino-, acetyl derivatives, A., 509.
- 1:1'-Dimethyl-5:5'-azotetrazole, A., 1043.
- Dimethyl-1:2-benzanthracenes, and their derivatives, A., 374.
- Dimethyl-1:2-benzanthraquinones, A., 1136.
- Dimethylbenzidines, dihydroxy-, and their derivatives, A., 1243.
- 3:3'-Dimethylbenzodifuran, A., 860.
- 4:4'-Dimethylbenzophenone, 3:3'-dicyano-, A., 1135.
- 1:2:4'-Dimethylbenzoylantraquinone-5-carboxylic acid, A., 617.
- 1-(3':4'-Dimethylbenzoyl)-2-methylnaphthalene, A., 374.
- 2:5-Dimethylbenzyl chloride and cyanide, A., 1241.
- pp'*-4:4'-Dimethylbenzylidenedihydrazino-*p''*-methyltriphenylmethane, A., 1026.
- 1:3-Dimethyl-3- $\beta$ -bromoethyl-2-indolinone, A., 288.
- 1:3-Dimethyl-3- $\beta$ -bromoethyl-2-indolinone, 5-hydroxy-, and its derivatives, A., 289.
- Dimethyl-*p*-bromophenylarsine, and its salts, A., 1120.
- $\beta\gamma$ -Dimethylbutadiene, action of ammonium sulphite on, A., 361.
- $\beta\gamma$ -Dimethyl- $\Delta\gamma$ -butadiene, polymerisation of, A., 361.
- $\gamma\delta$ -Dimethyl- $\Delta\gamma\gamma$ -butadiene,  $\beta$ -chloro-, A., 1232.
- Dimethylbutadienes, A., 141.
- polymerides of, A., 496.
- Dimethylcyclobutane, formation of, from cyclohexane, A., 938.
- $\beta\gamma$ -Dimethyl- $\Delta\alpha$ -butene, and its dibromide, A., 361.
- $\alpha\beta$ -Dimethyl- $\Delta\alpha$ -butenoic acid, methyl ester, dibromide of, A., 1143.
- cis-trans*-(Dimethyl)camphoceanes, di-amino-, and their chloroplatinates, A., 399.
- Dimethylcamphoranilio acids, A., 1253.
- Dimethylcarbamide, dihydroxy-, manufacture of, (P.), B., 591.
- resinification of, A., 150.
- 4:7-Dimethylcoumarin-6-arsinic acid, A., 761.

- 4:7-Dimethylcoumarin-6-azosulpho-*naphthylarsinic acid*, A., 1268.
- 2:4-Dimethyl-3- $\alpha$ -*dicyano- $\beta$ -carbethoxyethylpyrrole-5-carboxylic acid*, derivatives of, A., 626.
- 2:4-Dimethyl-3- $\beta$ -cyano- $\beta$ -carbethoxyvinylpyrrole-5-carboxylic acid, derivatives of, A., 626.
- 2:4-Dimethyl-3( $\omega$ -cyano- $\omega$ -carbethoxy)-vinylpyrrole-5-carboxylic acid, derivatives of, A., 285.
- $\beta$ -3:5-Dimethyl-2-( $\beta$ -cyano- $\beta$ -carbethoxyvinyl)-4-pyrrylpropionic acid, A., 861.
- 2:4-Dimethyl-3- $\beta$ -cyano- $\beta$ -carboxyvinylpyrrole-5-carboxylic acid, and its ethyl ester, A., 626.
- $\beta$ -3:5-Dimethyl-2- $\beta$ -cyano- $\beta$ -carboxyvinyl-4-pyrrylpropionic acid, A., 861.
- 2:4-Dimethyl-3- $\alpha\beta$ -tricyanoethylpyrrole, A., 626.
- 2:4-Dimethyl-3- $\alpha\beta$ -tricyanoethylpyrrole-5-carboxylic acid, ethyl ester, A., 626.
- 2:4-Dimethyl-3- $\beta\beta$ -dicyanovinylpyrrole-5-carboxylic acid, A., 626.
- 2:4-Dimethyl-3- $\alpha\beta$ -tricyanovinylpyrrole-5-carboxylic acid, ethyl ester, A., 626.
- 3:5-Dimethyl-2- $\beta\beta$ -dicyanovinylpyrrole-4-carboxylic acid, ethyl ester, A., 861.
- $\beta$ -3:5-Dimethyl-2-( $\beta\beta$ -dicyanovinyl)-4-pyrrylpropionic acid, A., 861.
- Dimethyldianthrone, A., 1241.
- 2:7-Dimethyl-12:15-diazofluorescein, A., 66.
- Dimethyldibenzoxazole, A., 1243.
- 2:4-Dimethyl-3:5-di- $\beta$ -carboxyethylindole, and its dimethyl ester, A., 281.
- 5:5'-Dimethyl-4:4'-di- $\beta$ -carboxyethylpyrromethene hydrobromide, and 3:3-di-bromo-, and its salts, A., 282.
- 2:4-Dimethyl-3:5-di- $\beta\beta$ -dicarboxyethylindole, and its tetramethyl ester, A., 281.
- Dimethyldiethylarsonium iodide, molecular compounds of, with mercury and cadmium iodides, A., 728.
- 4:3-Dimethyl-3:4'-diethyl-5'-bromoethylpyrromethene, 5-bromo-, and its hydrobromide, A., 174.
- 3:3'-Dimethyl-4:5'-diethyl-4'- $\beta$ -carboxyethylpyrromethene hydrobromide, A., 173.
- 4:3'-Dimethyl-3:4'-diethylpyrromethene, 5-hydroxy-, A., 1045.
- 1:4-Dimethyl-9:10-dihydroanthracene, 5:8-dichloro-9:10-dibromo-, A., 1135.
- 3:19-Dimethyl-8:9-dihydro-5:22-dihydroxy-acriquinolines, A., 754.
- 1:8-Dimethyl-1:8-dihydropyriminazole-4:5:8:7-tetracarboxylic acid, derivatives of, A., 1145.
- Dimethyldihydroresorcinol, reactivity of, A., 279.
- condensation products of, with aromatic aldehydes, and their derivatives, A., 279.
- use of, in identification of aldehydes and primary alcohols, A., 1235.
- 1:1-Dimethyldihydroresorcinol, derivatives of, A., 738.
- 5:5-Dimethyldihydroresorcinol, and its condensation products, A., 403.
- 3:4-Dimethyl-2:5-dihydrothiophen 1:1-dioxide, A., 361.
- Dimethyl diketone (*diacetyl*), preparation of, A., 499.
- dielectric constant of, A., 677.
- from action of pepsin on milk, A., 1287.
- detection of, in foods, B., 749.
- detection of, in pyrogenic gases from sugars, A., 592.
- 1:3-Dimethyl-3- $\beta$ -dimethylamino-2-indolinone, and its 6-nitro-derivative, and their salts, A., 288.
- 6:6'-Dimethyl-2:3:2':3'-dinaphtho-1:2:5:6-anthracene, A., 1136.
- 2:2'-Dimethyldiphenyl (2:2'-*ditolyl*) disulphide, A., 943.
- 2:2'-Dimethyldiphenyl, 6:6'-diamino-, dibenzoyl derivatives, A., 524.
- 3:3'-Dimethyldiphenyl (3:3'-*ditolyl*) selenide, and its derivatives, A., 181.
- disulphide, 6:6'-dinitro-, A., 940.
- 3:3'-Dimethyldiphenyl, 2:4:6:2':4':6'-hexachloro-, A., 740.
- 5-chloro-5'-amino-, and its tartrates, A., 942.
- 4:4':6-trifluoro- and 4:4'-difluoro-6-amino- and its salts, and 4:4'-difluoro-6:6'-dinitro-, A., 729.
- 5-halogeno-5'-nitro-, and 5'-nitro-5-hydroxy-, and its acetyl derivative, A., 152.
- 3:4'-Dimethyldiphenyl, A., 1121.
- 4:4'-Dimethyldiphenyls, amino-, and their acetyl derivatives, and *mono*- and *di*-nitro-, A., 1121.
- Dimethyldiphenyl series, A., 942.
- $\alpha\alpha$ -4:4'-Dimethyldiphenylacetone, crystal structure of, A., 1192.
- Dimethyldiphenylamines, 2:4-dinitro-, A., 1124.
- Dimethyldiphenylazo- $\beta$ -naphthol, *p*-amino-, and its acetyl derivative, A., 609.
- Dimethyldiphenylazo- $\beta$ -naphthyl sodium sulphite, *p*-amino-, A., 609.
- 3:3'-Dimethyldiphenyl-4:4'-diarsinic acid, derivatives of, A., 1148.
- Dimethyldiphenyldisazo-3:6:8-trisulpho- $\alpha$ -naphthol- $\beta$ -naphthyl sodium sulphite, A., 609.
- 4:4'-Dimethyldiphenyl-9:10-dihydroanthracene-1:5-dicarboxylic acid, 9:10-dihydroxy-, dilactone of, A., 618.
- 4:4'-Dimethyldiphenyldihydrophenanthrene-diol, A., 745.
- 3:3-Dimethyldiphenylene-4:4'-distibinous oxide, A., 866.
- $\alpha\alpha$ -4:4'-Dimethyldiphenylethylene glycol, A., 1246.
- 4:4'-Dimethyldiphenylmethane, polymerisation of, and 4:4'-*dihydroxy*-, and their derivatives, A., 1122.
- r*- $\alpha\alpha$ -4:4'-Dimethyldiphenyl- $\beta$ -methylbutanol,  $\beta$ -amino-, and its hydrochloride, A., 1126.
- 3:4'-Dimethyldiphenylsulphonic acid, derivatives of, A., 1121.
- Dimethyldi-*n*-propylarsonium antimonyl *d*-tartrate, A., 866.
- 3:3'-Dimethyl-5:5'-dipyrazoline, and its salts, A., 754.
- 1:1-Dimethyl-4:4'-dipyridylum chloride, as indicator, A., 1102.
- 7:7'-Dimethyl-8:8'-diquinolyl, A., 625.
- Dimethyl- $\Delta^2$ -dodecenylamine, and its picrate, A., 149.
- 1:4:5:8-Diendomethylenedecahydronaphthalene-2:3-dicarboxylic acids, and their derivatives, A., 938.
- $\beta\gamma\delta$ -Di(methylenedioxy)- $\Delta\alpha$ -hexadiene, A., 834.
- $\beta\gamma\delta$ -Di(methylenedioxy)hexane, and  $\alpha$ -chloro-, A., 835.
- 3:3'-Di(3:4-methylenedioxyphenyl)-4:4'-dimethyldicoumarin, A., 861.
- Di-(3:4-methylenedioxyethyl)benzodifuran, A., 861.
- 2-(3:4'-Dimethylenedioxyethyl)-7-methyl-3-ethyl-1:4-benzopyrone, A., 858.
- 2:3:4:5-Dimethylenemannitol, 1:6-dichloro- and 1:6-diiodo-, A., 834.
- Dimethylethylarsine, and its salts, A., 1119.
- 2:5-Dimethyl-3-ethyl-1:4-benzopyrone, A., 858.
- 3:3'-Dimethyl-4-ethyl-5'-bromoethyl-4'- $\beta$ -carboxyethylpyrromethane, 5-bromo-, hydrobromide, A., 173.
- 2:8-Dimethyl-3-ethylcoumarin, A., 519.
- 4:6-Dimethyl-3-ethylcoumarin, A., 620.
- 3:5-Dimethyl-4-ethyl-2- $\beta$ -cyano- $\beta$ -carbethoxyvinylpyrrole, A., 861.
- 3:5-Dimethyl-4-ethyl-2- $\beta$ -cyano- $\beta$ -carboxyvinylpyrrole, A., 861.
- 3:5-Dimethyl-4-ethyl-2- $\beta\beta$ -dicyanovinylpyrrole, A., 861.
- 3:3'-Dimethyl-4-ethyl-4:5'-di- $\beta$ -carboxyethylpyrromethene hydrobromide, 5-bromo-, A., 1263.
- 1:2-Dimethyl-5-ethylpyrrole, A., 622.
- 2:4-Dimethyl-3-ethylpyrrole. See *Cryptopyrrole*.
- 3:5-Dimethyl-4-ethyl-2-pyrryl-3:5-dimethyl-4-ethyl-2-pyrrylmethyl ketone, derivatives of, A., 285.
- Dimethylfraxetin, synthesis of, A., 858.
- Dimethylfumaric acid, esters, hydrolysis of, A., 721.
- 2:4-Dimethylfuran-3-aldehyde, and chloro-, and their semicarbazones, A., 1255.
- hydrazone of, A., 1255.
- 2:3-Dimethylfuran-4-carboxylic-5-acetic acid, diethyl ester, A., 1255.
- 2:4-Dimethylfuran-3-carboxylic acid, derivatives of, A., 1255.
- Dimethylfuran-3-carboxylic acids, and their derivatives, A., 1038.
- 2:4-Dimethylfuran-3-carboxylocyanide, and its derivatives, A., 1255.
- 3:5-Dimethylfurfuraldehyde, and its semicarbazone, A., 166.
- 3:4'-Dimethylfurocoumarin, A., 521.
- 3:5-Dimethylfuroic acid, A., 166.
- NN'*-Dimethylguanidine, salts of, A., 605.
- Dimethylheptane, and  $\alpha$ -bromo-, A., 360.
- d*- $\beta$ -Dimethylheptanol, A., 360.
- $\beta\delta$ -Dimethyl- $\Delta\alpha\gamma$ -heptatriene, A., 601.
- $\delta$ - $\beta$ -Dimethylheptoic acid, and its ethyl ester, A., 360.
- $\gamma\delta$ -Dimethyl- $\Delta\beta\delta$ -hexadiene, and its polymers, A., 496.
- $\gamma$ -Dimethylhexane, and  $\alpha$ -bromo-, A., 360.
- 1:1-Dimethylcyclohexane, preparation of, A., 372.
- 1:2-Dimethylcyclohexane, slow oxidation of, A., 837.
- 1:2-Dimethylcyclohexanes, stereoisomeric, A., 837.
- 1:3-Dimethylcyclohexane, slow combustion of, A., 372.
- Dimethylcyclohexanes, stereoisomeric, dehydrogenation of, A., 1240.
- Dimethylcyclohexanone, detection of aldehydes with, B., 56.
- d*- $\gamma$ -Dimethylhexanol, A., 360.
- 1:1-Dimethylcyclohexan-3-ol, derivatives, A., 372.
- Dimethylcyclohexanones, methylation of, and their derivatives, A., 161.
- 2:3-Dimethyl- $\Delta^2$ -cyclohexenone-4-carboxylic acid, ethyl ester, A., 163.
- 3:5-Dimethyl- $\Delta^1$ -cyclohexenyl ethyl ether, 2-cyano-, A., 744.
- d*- $\beta\delta$ -Dimethylhexoic acid, and its ethyl ester, A., 360.
- Dimethylcyclohexylarsine, and its salts, A., 1120.
- Di-(2-methylcyclohexyl)malonamide, A., 371.
- Di-(2-methylcyclohexyl)oxamide, A., 371.
- s*-Dimethylhydrazine, catalytic decomposition of, A., 478.
- 1:1'-Dimethyl-5:5'-hydrazotetrazole, A., 1043.

- 4:6-Dimethyl-2-hydroxydiphenylmethanes, bromo- and chloro-, and their antibacterial action, A., 1026.
- Dimethyl- $\beta$ -hydroxy- $\epsilon$ -phenyl-*n*-amylamine benzoate hydrochloride, A., 394.
- Dimethyl- $\beta$ -hydroxy- $\delta$ -phenyl-*n*-butylamine benzoate hydrochloride, A., 394.
- Dimethyl- $\beta$ -hydroxy- $\xi$ -phenyl-*n*-hexylamine, and its salts, A., 395.
- Dimethyl- $\beta$ -hydroxy- $\gamma$ -phenylpropylamine benzoate hydrochloride, A., 394.
- 2:3-Dimethylindole, 5-amino-, acetyl derivative, and bromonitro- and nitro-, A., 402.
- 3:3-Dimethylindolenine, A., 287.
- 3:3-Dimethylindolenine-2-carboxylic acid, and its derivatives, A., 287.
- 3:3-Dimethylindolinone, 5-amino-, 4:7-dibromo-, 4:7-dichloro-, 5-iodo-, and *mono*- and *di*-nitro-, and their salts and derivatives, A., 65.
- Di-2-methyl-3-indolylphosphinic acid, and its salts, A., 954.
- $\alpha\alpha'$ -Di-(1-methyl-2-indolyl)succinic acid, methyl ester, A., 1144.
- dl*-1:1-Dimethyl-2- $\gamma$ -ketobutylcyclopropane-3-carboxylic acids, synthesis of, and their oximes, A., 739.
- Dimethyl ketone in butter, B., 445.
- Dimethylketopentene, constitution of, A., 1255.
- 2:2-Dimethyl-4-ketotetrahydrobenzopyrylium chloride, A., 279.
- $\beta\beta$ -Dimethylmalic acid,  $\beta$ -lactone, A., 614.
- Dimethylmangostin, A., 64.
- derivatives of, A., 855.
- 1:4-Dimethyl-9-methoxy-9:10-dihydroanthraquinyl-9:10-endo- $\alpha\beta$ -succinic anhydride, A., 745.
- 1:3-Dimethyl-3- $\beta$ -methylaminoethyl-2-indolinone, and its hydrogen oxalate, A., 288.
- $\eta\lambda$ -Dimethyl- $\gamma$ -methylene- $\Delta^6$ -dodecene- $\alpha$ -ol, A., 1110.
- 2:3-Dimethylmethylglucoside 4:6-dinitrate, and 6-iodo-, 4-nitrate, A., 603.
- 2:3-Dimethyl- $\beta$ -methylglucoside *mono*- and *di*-nitrates, and 6-iodo-, A., 254.
- Dimethylmorphine, and its salts, A., 952.
- 1:4-Dimethylnaphthalene, side-chain nitration of, and  $\omega$ -amino-, derivatives of, and  $\omega$ -nitro-, A., 941.
- Dimethylnaphthalenes, 4-amino-, and its acetyl derivative, *mono*- and *di*-bromo- and 4-nitro-, A., 261.
- 3:4-Dimethyl-1:2- $\alpha$ -naphthapyrone, A., 520.
- 2:3-Dimethyl-1:4- $\alpha$ -naphthapyrone, A., 520.
- Dimethyl- $\beta\alpha$ -naphthapyrones, A., 1257.
- 6:7-Dimethyl-2-naphthoic acid, and its methyl ester, A., 1024.
- 2:6-Dimethyl- $\alpha$ -naphthol, and 4-nitro-, and its acetyl derivative, A., 261.
- 5:8-Dimethyl- $\alpha$ -naphthol, and its methyl ether, A., 948.
- Dimethyl- $\alpha$ -naphthoylbenzoic acids, and their esters, A., 1136.
- $\beta$ -6:7-Dimethyl-2-naphthoylpropionic acid, and its methyl ester, A., 1024.
- 3:7-Dimethyl- $\beta$ -naphthylamine, A., 261.
- Dimethyl- $\beta$ -naphthylarsine, and its methiodomercurate, A., 1120.
- $\gamma$ -6:7-Dimethyl-2-naphthyl- $\Delta\beta$ -pentenoic acid, A., 1024.
- 3:3'-Di(methylnitroamino)diphenyl, A., 508.
- Dimethyl-10-nitroanthrones, and their acetyl derivatives, A., 745.
- 2:5-Dimethyl-3-nitrofuran, A., 1038.
- $\gamma\gamma$ -Dimethyl-*n*-nonanedicarboxylic acid, derivatives of, A., 1234.
- $\gamma\gamma$ -Dimethyl-*n*-nonane- $\alpha\alpha\alpha$ -tetracarboxylic acid, tetraethyl ester, A., 1234.
- $\gamma\zeta$ -Dimethyl- $\Delta^6$ -octadiene- $\alpha\gamma$ -diol, and its derivatives, A., 1110.
- $\gamma\gamma$ -Dimethyl- $\Delta^6$ -octadien- $\alpha$ -ol, and its dibromide, A., 1110.
- d*- $\beta\epsilon$ -Dimethyloctane, A., 361.
- $\gamma\gamma$ -Dimethyloctane- $\alpha\gamma$ -diol, A., 1110.
- d*- $\delta\delta$ -Dimethyloctanol, A., 361.
- Dimethyloctatrienal, and its derivatives, A., 834.
- $\beta\zeta$ -Dimethyl- $\Delta^{\alpha\gamma\epsilon}$ -octatrienoic acid, A., 600.
- $\gamma\gamma$ -Dimethyl- $\Delta^{\gamma}$ -octen- $\alpha$ -ol, A., 1110.
- $\beta\zeta$ -Dimethyloctoic acid,  $\epsilon$ -trimethylammonium salt, and its salts, and *l*- $\epsilon$ -amino-, A., 726.
- 1:1-Dimethylcyclopentane, preparation of, A., 372.
- 1:3-Dimethylcyclopentane, slow oxidation of, A., 372.
- $\beta\beta$ -Dimethylpentane, in Oklahoma petroleum, B., 1112.
- $\alpha\epsilon$ -Dimethyl-*n*-pentanedicarboxylic acid, and its derivatives, A., 1234.
- $\alpha\epsilon$ -Dimethyl-*n*-pentane- $\alpha\alpha\epsilon\epsilon$ -tetracarboxylic acid, tetraethyl ester, A., 1234.
- $\beta\delta$ -Dimethylpentanol, and its derivatives, B., 250.
- $\beta\delta$ -Dimethylpentan- $\alpha$ -ol, synthesis of, and its 3-nitrophthalate, A., 142.
- $\alpha\beta$ -Dimethylpentenoic acid, A., 1111.
- $\alpha\beta$ -Dimethylpentenoic acids, ethyl esters, A., 1111.
- 2:6-Dimethylperimidine, and 7-chloro-, A., 1122.
- 1:4-Dimethylphenanthrene, and its picrate, A., 1241.
- 1:7-Dimethylphenanthrene, synthesis of, A., 839.
- 9:10-Dimethylphenanthridinium derivatives, 4-amino-, acetyl derivatives, A., 1041.
- 1:3-Dimethyl-3- $\beta$ -phenoxyethyl-2-indolinone, A., 1288.
- Dimethylphenylacetamide, action of magnesium *p*-anisyl bromide on, A., 745.
- 2:5-Dimethylphenylacetic acid, ethyl ester, A., 1241.
- $\gamma$ -(2:5-Dimethylphenyl)butyric acid, chloride of, A., 948.
- Dimethylphenyl trichloromethyl ketones, *di*-trichloro-, A., 851.
- 4-*N'**N'*-Dimethyl-*p*-phenylenediamino-2-phenylquinoline, A., 623.
- $\beta$ -2:5-Dimethylphenylethyl alcohol, and its bromide, A., 1241.
- Dimethyl- $\beta$ -phenylethylarsine, and its salts, A., 1120.
- 2-( $\beta$ -2':5'-Dimethylphenylethyl)cyclohexanol-2-carboxylic acid, ethyl ester, A., 1241.
- 2-( $\beta$ -2':5'-Dimethylphenylethyl)cyclohexanone-2-carboxylic acid, ethyl ester, A., 1241.
- $\gamma$ -(2:5-Dimethylphenyl)valeric acid, and its chloride, A., 278.
- Dimethylphosphordimethyl-*n*-methylriboside, A., 1236.
- $\alpha\alpha$ -Dimethylphthalidecarboxylic acids, and their ethyl esters, A., 382.
- 2:5-Dimethylpiperazines, formation of, A., 625.
- 1:2-Dimethylcyclopropane-1:2-dicarboxylic acids, and their methyl esters, A., 1143.
- Dimethylpropionylacetone, A., 1269.
- Dimethyl-*n*-propylarsine, and its methiodide, A., 1119.
- 2:3-Dimethyl-3-isopropylchromone, 7-nitro-, A., 520.
- 2:3-Dimethyl-6-isopropylcyclohexanone, and its tetrahydropyrene, A., 162.
- 3:3'-Dimethyl-2:2'-propylidenedinitroindoles, A., 402.
- 1:4-Dimethyl-7-isopropylphenanthrene, and its salts, A., 839.
- 5:5'-Dimethylpyranthracene, 4:4'-dicyano-, A., 1260.
- Dimethylpyrazolecarboxylic acid, ethyl ester, hydrobromide, A., 1144.
- Dimethylpyrazolinocarboxylic acids, derivatives of, A., 863.
- trans*-4:5-Dimethylpyrazoline-4:5-dicarboxylic acids, methyl esters, A., 863.
- Dimethylpyrogallol. See Pyrogallol 1:3-dimethyl ether.
- Dimethylpyrone, ternary additive compounds of, A., 718.
- 2:3-Dimethylpyrrole-5-aldehyde, and its derivatives, A., 173.
- 3:4-Dimethylpyrrole-2:5-dicarboxylic acid, A., 173.
- 3:5-Dimethyl-2-pyrrol 3:5-dimethyl-2-pyrrolmethyl ketone, derivatives of, A., 285.
- Di-(5-methyl-2-pyrrol)methane, *di*-4-cyano-, A., 1260.
- $\gamma\gamma$ -Di-(5-methyl-2-pyrrol)pentane,  $\gamma\gamma$ -*di*-4-cyano-, A., 1260.
- $\beta\beta$ -Di-(5-methyl-2-pyrrol)propane,  $\beta\beta$ -*di*-4-cyano-, A., 1260.
- $\alpha$ -2:3-Dimethyl-5-pyrrolsuccinic acid, and its methyl ester, A., 1144.
- 2:5-Dimethylquinol-2-camphorsulphone, and its diacetate, A., 947.
- 6:8-Dimethylquinoline-4-carboxylic acid, A., 754.
- Dimethylrubrenes, and their oxides, A., 732.
- Dimethyl- $\psi$ -rubrenes, A., 261.
- 3:3'-Dimethyl-4:5:4':5'-tetra- $\beta$ -carboxyethylpyrromethene hydrobromide, A., 861.
- 3:3'-Dimethyl-4:5:4':5'-tetraethylpyrromethene, and its derivatives, A., 174.
- 3:4-Dimethyl-1:4:11:12-tetrahydroanthraquinone, 2-chloro-, A., 1232.
- 1:3-Dimethyl- $\Delta^2$ -tetrahydrophthalic acid, and its derivatives, A., 1036.
- 3:4-Dimethyl- $\Delta^4$ -tetrahydrophthalic anhydride, A., 141.
- 3:4-Dimethyltetrahydrothiophen 1:1-*di*-oxide, and its derivatives, A., 361.
- Dimethylthioarsinic acid, carbamylmethyl ester, A., 761.
- Dimethylthiocarbamic acid, *di*isobutylammonium, quinine, and strychnine salts, A., 150.
- esters of, A., 509.
- 4:5-Dimethylthiol-4:5-*di*- $\alpha$ -naphthyltrimethylene 1:3-*disulphate*, A., 372.
- Di-(5-methylthiol-2-thienyl)thiophen, mercury derivative, A., 752.
- 2:4-Dimethylthioltriphenylcarbinol, A., 1027.
- 3:4-Dimethylthionaphthen, 7-chloro-2-hydroxy-, manufacture of, and indigo dyes therefrom, (P.), B., 253.
- Dimethyltolylarsines, and their salts, A., 1120.
- 1:16-Dimethyl- $\Delta^{1:15}$ (or $^{16}$ )-cyclotriacontadiene, A., 58.
- 1:16-Dimethylcyclotriacontane, A., 58.
- $\beta\delta$ -Dimethyl- $\Delta\alpha$ -tridecenoic acid, ethyl ester, A., 832.
- $\beta\delta$ -Dimethyltridecoic acid, and its derivatives, and  $\beta$ -hydroxy-, ethyl ester, A., 832.
- 4:4'-Dimethyltriphenylcarbinol, 4-chloro-, A., 515.
- 4:4''-Dimethyltriphenylmethane, 4-chloro-, A., 515.
- 2-nitro-, A., 374.

*NN'*-Dimethyltryptamine, and its salts, A., 289.  
 Dimethylsugic acid, A., 275.  
 1:3-Dimethyluracil, 4-chloro-, A., 404.  
 3:9-Dimethyl- $\Delta^{8,7}$ -isouric acid, 4-chloro-, A., 1045.  
*ON*-Dimethylomicinic acid, and its derivatives, A., 179, 408.  
 Dimethylxanthone, dihydroxy-, A., 1258.  
 Dimethylxylylarsine, A., 1120.  
 Dimetol. See Dimethylcyclohexanedione.  
 Dimyristopalmitins, A., 931.  
 $\beta\beta$ -Dinaphthacarbazole, and *mono*- and *di*-amino-, and their derivatives, and *di*-bromo-, *mono*- and *di*-nitro- and *N*-nitroso-, A., 404.  
 Dinaphthacridonequinone, and its derivatives, A., 951.  
 $\alpha\beta\beta'$ -Dinaphthathioxin, and 6:13-*di*bromo-, A., 379.  
 2':3':2'':3'':-Dinaphtho-1:2:5:6-anthracene, A., 1136.  
 1:2:7:8-Dinaphthoperylene-3:9-quinone, A., 618.  
 3:3-Di-1:2- $\beta$ -naphthopyrone, A., 751.  
 Dinaphtho- $\gamma$ -pyrone, preparation of, and its anil, A., 859.  
 Dinaphthoyl sulphides, A., 268.  
 Di- $\beta$ -naphthoyl disulphide, A., 1246.  
*NN'*-Di- $\beta$ -naphthoylhydrazine, A., 847.  
*NN'*-Di- $\beta$ -naphthoylhydrazine, *di*-3-iodo-, A., 840.  
 Dinaphthyls, *mono*- and *di*-amino-, imino- and nitroamino-, and their derivatives, A., 376.  
 2:2'-Dinaphthyls, nitro-, A., 153.  
 Dinaphthyl bases, A., 376.  
 Dinaphthylcarboxylic acids, optically active, and their salts and derivatives, and 4-chloro-, ethyl ester, A., 270.  
 1:1'-Dinaphthyl-8:8'-dicarboxylic acid, A., 56.  
 1:1'-Dinaphthyl-8:8'-dicarboxylic acids, optically active, and their derivatives, A., 270.  
 9:10-Di- $\alpha$ -naphthyl-9:10-dihydroanthracene-1:5-dicarboxylic acid, 9:10-*di*hydroxy-, dilactone of, A., 618.  
 1:1'-Dinaphthyl-5:5'-disulphonic acids, 2:2'-*di*amino-, barium salts and dye derivatives, and 2:2'-*di*nitro-, barium salts, A., 263.  
 1:9-5:10-Diperinaphthyleneanthracene, synthesis of, A., 1123.  
 1:9-5:10-Diperinaphthyleneanthracene-*endo*-9:10- $\alpha\beta$ -succinic anhydride, A., 1123.  
 Di-1-naphthylgermanic anhydride, A., 866.  
 Di-4-naphthyl-5-hydroxymethyl-2-furyl-methane, *di*-1-hydroxy-, and its derivatives, A., 933.  
 1:1'-Dinaphthyl ketone, 2:2'-*di*hydroxy-, and its diacetyl derivative, A., 859.  
 1:2'-Dinaphthylmethane-2-carboxylic acid, A., 747.  
 Dinordeoxyseseroline, preparation of, A., 952.  
 Dicycloctenyl, A., 58.  
 Di- $\beta$ -octyl hydrogen phosphite, A., 251.  
 1:1-Dicycloctyl, and 1:1'-*di*hydroxy-, A., 58.  
 $\alpha\alpha$ -Di-*n*-octylhexonitrile, A., 727.  
 Dioctyl ketone, *di*- $\beta$ -hydroxy-, A., 832.  
 $s$ -Di-*n*-octylmalonamide, A., 371.  
 Diolefines, removal of, from gases, (P.), B., 9.  
 polymerisation of, A., 830; (P.), B., 378, 494.  
 identification of, in cracked gasoline, B., 247.  
 Diopside, thermochemistry of, A., 1092.  
 Diopase, crystal structure of, A., 114.

Dioxan. See Diethylene dioxide.  
 5:5'-Diisooxazoloylfuroxan phenylhydro-azone, A., 1145.  
*trans*-Dioxidobisdi-indonylene, A., 747.  
 Dioximes, A., 57, 272, 499, 513, 1146, 1266.  
 1:3-Dioxins, A., 949.  
 Dioxindole, condensation of chloro-isatins with, A., 169.  
 2:2'-Dioxyacetylmercuri-3:3':5:5'-tetra-acetylmercuridiphenyl, A., 410.  
 Dipalmitin  $\alpha$ -iodohydrin, A., 364.  
 Dicyclopentadecyl, and 1:1'-*di*hydroxy-, A., 58.  
 Dipentaerythritol hexanitrate, explosive properties of, B., 705.  
 Dipentene sulphide, and its derivatives, A., 1038.  
 Dipptides, and their salts, from tryptic digestion of clupein, A., 1269.  
 hydrolysis of, by alkali, A., 1148.  
 Diphenacyldimethylammonium bromide, *di*-*p*-bromo-, A., 854.  
 Di-*p*-phenetoleazoxybenzoylpyrocatechol, A., 942.  
 Di-*p*-phenetoleazoxybenzoylquinol, A., 942.  
 Di-*p*-phenetoleazoxybenzoylresorcinol, A., 942.  
 Diphenic acid, 5:5'-*di*bromo-, A., 855.  
 3:3'-Diphenol, 2:4:6:2':4':6'-hexanitro-, salts of, A., 943.  
 $\alpha\kappa$ -Diphenoxydecane, A., 1029.  
 4-Diphenoxy-3:3'-dimethyldiphenyl disulphide, *di*-*p*-nitro-, A., 735.  
 2:2'-Diphenoxydiphenyl ether, A., 261.  
 Diphenoxyperylene-3:10-quinone, and *di*-*p*-chloro-, A., 1035.  
 Di-*p*-phenoxypheylselenium salts and dihydroxide, A., 70.  
 Diphenoxyphosphoric acid, creatinine salt, A., 951.  
 Diphenoxyphosphorylcreatine, and its sodium salt, A., 951.  
 $\alpha\delta$ -Diphenoxy- $\beta$ -isopropyl- $\Delta\beta$ -butene, A., 43.  
 Diphenyl, and its derivatives, A., 152, 508, 607, 943.  
 X-ray structure of, A., 798.  
 synthesis of, A., 729.  
 stereochemistry of, A., 739, 945.  
 equilibrium of, with benzene, diphenylbenzene, and hydrogen, A., 1203.  
 with benzene and hydrogen, A., 1203.  
 chlorination of, (P.), B., 253.  
 and its derivatives, (P.), B., 174.  
 derivatives, dimorphism of, A., 729.  
 use of, for high-temperature heating, B., 627.  
 formation of additive products of, A., 52.  
 arsenical, A., 1148.  
 unsymmetrical, preparation of, A., 843.  
 2:2'-disubstituted derivatives, influence of 2'-substituents in, A., 509.  
 stereochemistry of, A., 942, 1241.  
 Diphenyl, amino-derivatives, *p*-toluenesulphonyl derivatives, A., 375.  
*di*amino-, *di*fluoro-, *tri*fluoro-*di*amino- and *di*nitro-, and *di*nitro-, A., 729.  
 2:2'-*di*amino-, action of dibasic acids on, and its derivatives, A., 508.  
 acyl derivatives, nitration of, A., 508.  
 2'-acetyl derivative, and its hydrochloride, and 2'-benzoyl derivative, A., 524.  
 diacetyl derivative, *tetra*amino-, and *dinitro*-2:2'-*di*amino-, and their derivatives, A., 509.  
 2:4'-*di*bromo-, A., 1240.  
 4:4'-*di*bromo-, 4:4'-*di*chloro-, and 4-chloro-4'-bromo-, quantitative nitration of, and 4:4'-*di*chloro-2:3':5'-*tri*nitro-, A., 259.

Diphenyl, bromo-2'-amino-, -iodo- and -2'-nitro-, 2-chloro-2'-amino-, -2'-bromo-, 2'-iodo- and -2'-nitro-, and 2-iodo-2'-amino-, acetyl derivative, and 2-iodo-2'-nitro-, A., 152.  
 bromo-4'-amino-, and their derivatives, A., 1240.  
 3:5:3':5'-*tetra*bromo-2:2'-*di*amino-, diacetyl derivative, A., 1027.  
 2:4:6:2':4':6'-*hexa*chloro-3:3'-*di*amino-, and its dichloroacetyl derivative, and -3:3'-*di*nitro-, A., 740.  
 2:2'-*di*chloro-4:4':6:6'-*tetra*nitro-, A., 729.  
*p*-hydroxy-, bromo- and chloro-derivatives of, (P.), B., 974.  
 4:4'-*di*fluoro-, nitration of, and 4:4'-*di*fluoro-2:2'-*di*nitro-, A., 374.  
 iodo-derivatives of, by action of iodine, in presence of nitric acid, A., 152.  
 4-iodo-4'-amino- and -4'-nitro-, and their derivatives, A., 152.  
 4-iodo-4'-hydroxy-, and its derivatives, A., 52.  
 nitroamino-, manufacture of derivatives of, (P.), B., 833.  
*mono*- and *di*-nitrodiamino-, and their acetyl derivatives, and nitro-amino-hydroxy- and *mono*- and *di*-hydroxy-, A., 1026.  
 2-*o*-nitroamino-5-nitro-, acetyl derivative, A., 1041.  
*tetra*nitro-derivatives, dimorphism of, A., 267, 508.  
 3:5:3':5'-*tetra*nitro-2:2'-*di*hydroxy-, diacetyl derivatives of, A., 267, 1027.  
 Diphenyl ether, derivatives of, A., 175.  
*o*-amino-, formyl derivative, A., 1242.  
 4'-bromo- and 4'-chloro-*di*iodo-4-hydroxy-, and 4'-chloro-3:5-*di*bromo-2':6'-*di*iodo-4-hydroxy-, and its salts, A., 842.  
 2-iodo-, A., 261.  
 ethyl ether, 4-hydroxy-, A., 844.  
 disulphide, *hexa*bromo-, A., 843.  
 4-hydroxy-3-bromo- and -3-nitro-, A., 844.  
*di*-2-nitro-4-cyano-, A., 1046.  
 3:5:3':5'-*tetra*nitro-, A., 940.  
 sulphides, nitroamino-, manufacture of, (P.), B., 974.  
*mono*- and *di*-sulphoxides, *di*nitro-, A., 373.  
 dithiolcarbonate, 2:4:6-*tri*bromo-, A., 843.  
 Diphenyl series, A., 259, 374, 1025, 1121.  
 Diphenylacetaldehyde, hydroxy-, and its semicarbazone, A., 851.  
*o*-Di-(phenylacetyl)benzene, *di*-( $\alpha\alpha$ -*di*-bromo-), A., 396.  
 $\beta\epsilon$ -Di(phenylacetylenyl)hexane- $\beta\epsilon$ -diol, A., 447.  
 Diphenylacetylphthalimide, A., 849.  
 Diphenylamine, tars formed in manufacture of, B., 1070.  
 vapour, photo-ionisation of, A., 1076.  
 derivatives, differences in colour in, A., 733.  
 use of, as an internal indicator, A., 243.  
 Diphenylamine, *di*- and *tetra*-chloro-, and their benzoyl derivatives, A., 846.  
 nitro-derivatives of, A., 1124.  
 thio-, beryllisation of, A., 67.  
 derivatives of, A., 630.  
 Diphenylamine-6-arsinic acid, 3-nitro-, A., 181.  
 Diphenylamine-2-carboxylic acid, 4'-chloro-5-nitro-, A., 862.  
 Diphenylamine-4-carboxylic acid, 2-nitro-, and 6-bromo-2-nitro-, methyl esters, A., 734.

$\beta\gamma$ -Diphenyl- $\alpha$ - $p$ -aminophenylguanidine, A., 376.  
 Diphenylamylarsines, A., 1120.  
 $\alpha\beta$ -Diphenyl- $\beta$ - $p$ -anisylacrylic acids, A., 848.  
 $\alpha\beta$ -Diphenyl- $\beta$ - $p$ -anisylvinyl bromide, A., 848.  
 9:10-Diphenylanthracene-1:5:2':4':2''-hexacarboxylic acid, and its hexaethyl ester, A., 731.  
 9:10-Diphenylanthracene-1:5:2':5':2''-hexacarboxylic acid, and its esters, A., 732.  
 10:10-Diphenylanthrone, 1:8-dichloro-, A., 395.  
 Diphenyl-4'-arsinic acid, 2-amino-, A., 1148.  
 Diphenylarsinyl iodide, reaction of, with piperidine N-pentamethylenedithiocarbamate, A., 953.  
 Diphenylazodisulpho- $\alpha$ -naphthyl sodium sulphites, 4'-amino-, A., 609.  
 Diphenylazo- $\beta$ -naphthol, 4'-amino-, and its acetyl derivative, A., 609.  
 Diphenylazo- $\beta$ -naphthyl sodium sulphite, 4'-amino-, A., 609.  
 Diphenylazo-8-sulpho- $\beta$ -naphthyl sodium sulphite, 4'-amino-, A., 609.  
 1:1'-Diphenyl-5:5'-azotetrazole, A., 1044.  
 Diphenylbenzene, equilibrium of, with benzene, diphenyl, and hydrogen, A., 1203.  
*m*-Diphenylbenzene, nitration of, and its derivatives, A., 940.  
*m*-Diphenylbenzeneazo- $\beta$ -naphthol, dye derivatives of, with sulphonic acids, A., 940.  
 2:5-Diphenyl-3:4-benzofuran, condensation of, with unsaturated compounds, A., 1257.  
 Diphenylbenzidine, use of, as an internal indicator, A., 243.  
 detection of nitrates and nitrites with, A., 1221.  
 1:4-Diphenyl-2:3-benzofluorene, A., 1257.  
 1:4-Diphenyl-2:3-benzofluorenone, A., 1257.  
 8:4':4''-Diphenylbenzpinacol, 4:4'-dichloro-, A., 515.  
 Diphenylbenzylidenes, A., 273.  
 Diphenyl- $p$ -bromophenylacetylenylcarbinol, and its derivatives, A., 616.  
 $\alpha\gamma$ -Diphenyl- $\beta$ - $p$ -bromophenylbutyric acid,  $\beta$ -hydroxy-, A., 158.  
 $\alpha\alpha$ -Diphenyl- $\gamma$ -( $p$ -bromophenyl)-4 $\beta$ -propylene,  $\alpha$ -chloro-, A., 616.  
 derivatives of, A., 260.  
 $\alpha\alpha$ -Diphenylbutadiene, A., 1249.  
 $\alpha\gamma$ -Diphenylbutadiene, dimeric of, A., 496.  
 $\alpha\alpha$ -Diphenylbutaldehyde, and its semicarbazone, A., 273.  
 $\alpha\delta$ -Diphenylbutane diperoxide,  $\alpha\beta\gamma\delta$ -tetraoximino-, A., 1146.  
 2:4-Diphenylcyclobutane-1-carboxylic acid, 3-amino-, and its derivatives, A., 158.  
 $\alpha\alpha$ -Diphenylbutan- $\beta$ -one, A., 368.  
 $\alpha\delta$ -Diphenyl-4 $\gamma$ -butene- $\beta$ -carboxylic acid,  $\alpha$ -bromo-, and  $\alpha$ -hydroxy-, and their methyl esters, A., 158.  
 Di-( $\beta$ -phenylbutyl)amine, *di*- $\beta$ -hydroxy-, and its hydrochloride, A., 394.  
 Diphenylbutylarsines, and their derivatives, A., 1120.  
 Diphenyl*tert*-butylethylacetic acid, A., 50.  
 $\beta\beta$ -Diphenylbutyryl chloride, A., 273.  
 Di-(*N*'-phenylcarbamidoethyl) ether *di*- $\alpha$ - $\beta\beta\beta$ -trichloro-, A., 151.  
 $\alpha\beta$ -Di(phenylcarbamyl)- $p$ -bromophenylhydrazine, A., 942.  
 $\alpha\beta$ -Di(phenylcarbamyl)phenylhydrazine, A., 942.  
 Diphenylcarbodi-imide, *pp'*-dibromo-, A., 840.

Diphenylcarboxylic acid, nitro-, A., 940.  
 Diphenyl-2-carboxylic acid, 4'-hydroxy-, A., 733.  
 Diphenyl-3-carboxylic acid, 4-amino-, acetyl derivative, A., 1024.  
 Diphenylcarboxylic acid, 2-amino-, acetyl derivative, and nitro-derivatives, A., 838.  
 $\alpha\beta$ -Diphenyl- $\beta$ - $p$ -chlorophenylacrylic acids, A., 848.  
 Diphenyl-*o*-chlorophenylbenzamidines, A., 846.  
 Diphenyl-3:5-dichlorophenylbenzamidines, A., 846.  
 $\alpha\beta$ -Diphenyl- $\alpha$ - $p$ -chlorophenylethyl alcohol, A., 848.  
 $\alpha\beta$ -Diphenyl- $\beta$ - $p$ -chlorophenylvinyl bromides, A., 848.  
 $\alpha\alpha$ -Diphenyldianisylethylene glycol, A., 737.  
 Diphenyl-2:4'-diarsinic acid, A., 1148.  
 Diphenyldiazo-4:8-disulpho- $\alpha$ -naphthol-8-sulpho- $\beta$ -naphthyl sodium sulphite, A., 609.  
 Diphenyldiazomethane, reaction of, with mercuric chloride, A., 937.  
 9:11-Diphenyl-9:12:10:11-dibenzo-9:11-dihydronaphthalene, reduction of, A., 374.  
 sodium derivative, hydrocarbons formed by hydrolysis of, A., 507.  
 Diphenyl-3:3'-dicarboxylic acids, 2:4:6:2':4':6'-hexachloro-, and their brucine salts, A., 739.  
 Diphenyldiethylammonium chloride, 2:3:4:6-tetranitro-, A., 53.  
 $\alpha$ -Diphenyldiethylcarbamide, molecular compounds of, A., 376.  
 4:4'-Diphenyl-1:1'-diethyl-2:2'-carbocyanine iodide, A., 282.  
 4:4'-Diphenyl-1:1'-diethyl-2:2'-dicarbocyanine, 10-bromo-, and 11-chloro-, iodides of, A., 283.  
 Diphenyldiethyldiketodi-indanyls, *di*bromo-, A., 514.  
 Diphenyldiethylgermane, A., 606.  
 $\alpha\beta$ -Diphenyldiethyl ketone, and its semicarbazone, A., 393.  
 9:10-Diphenyl-9:10-dihydroanthracene-1:5-dicarboxylic acid, and its ethyl ester, A., 617.  
 9:10-Diphenyl-9:10-dihydroanthracene-1:5-dicarboxylic acid, 4:8-dichloro-9:10-dihydroxy-, and 9:10-dihydroxy-, dilactones of, A., 618.  
 9:10-Diphenyldihydroanthracene-1:5:2':5':2''-hexacarboxyldilactone, 9:10-dihydroxy-, and its derivatives, A., 732.  
 9:10-Diphenyldihydroanthracene-1:5:2':4':2''-hexacarboxylic acid, and its derivatives, A., 731.  
 9:10-Diphenyldihydroanthracene-1:5:4':4'-tetracarboxylic acid, 9:10-dihydroxy-, and its derivatives, A., 732.  
 3:3'-Diphenyl-1:1'-di-indenyl-1:1'-dicarboxylic acid, ethyl ester, A., 270.  
 Di-( $\beta$ -phenyl- $\gamma$ - $p$ -dimethylaminophenylpropyl)amines, and their derivatives, A., 60.  
 8:4''-4'''-Diphenyldimethylbenzpinacols, A., 515.  
 $\alpha$ -Diphenyldimethylcarbamide, molecular compounds of, A., 376.  
 4:4'-Diphenyl-1:1'-dimethyl-2:2'-carbocyanine iodide, A., 282.  
 3:3'-Diphenyl-4:4'-dimethyldicoumarin, and 3:3'-*di*- $p$ -hydroxy- and -*di*- $p$ -nitro-, A., 861.  
 9:10-Diphenyl-2:6-dimethyl-9:10-dihydroanthracene-1:5-dicarboxylic acid, 9:10-dihydroxy-, dilactone, A., 618.  
 3:6-Diphenyl-2:5-dimethyl-3:6-dihydro-1:4-diazine, 3:6-*di*-2:4'-*dinitro*-, A., 404.

*as*-Diphenyldimethyldiphenylethylene glycols, A., 737.  
 $\alpha\alpha$ -Diphenyl- $\delta\delta$ -dimethyl-4 $\alpha\beta$ -pentadienes, A., 50.  
 $\alpha\alpha$ -Diphenyl- $\delta\delta$ -dimethylpentane, A., 505.  
 2:5-Diphenyl-2:5-dimethylpiperazine *di*-hydrochloride, A., 256.  
 4:4'-Diphenyl-1:1'-dimethylquinazocarbocyanine iodide, A., 282.  
 2:5-Diphenyl-3:4-dimethyltetrahydro-oxazole, A., 757.  
 2:3-Diphenyl-1-diphenyleneindene, A., 1024.  
 Diphenyldiphenylacetic acid, and its methyl ester, A., 572.  
 2:3-Diphenyl-6- $p$ -diphenylpyridine, A., 385.  
 $\beta$ -1:1-Diphenyl-2:3:4-5-disopropylidene-fructose, A., 147.  
 6:6'-Diphenyl-3:3'-dipyridyl-2:4:2':4'-tetracarboxylic acid, preparation and resolution of, A., 755.  
 Diphenyldisazobis-8-sulpho- $\beta$ -naphthyl sodium disulphite, A., 610.  
 Diphenyldisazophenetole-6:8-disulpho- $\beta$ -naphthyl sodium sulphite, A., 609.  
 Diphenyldisazo-3:6:8-trisulpho- $\alpha$ -naphthol- $\beta$ -naphthyl sodium sulphite, A., 609.  
 Diphenyl-2:2'-disulphonic acid, resolution of, and its salts, A., 1241.  
 Diphenyl-2:2'-disulphonic acids, 4:4'-diamino-, and their camphorsulphonates and 4:4'-*dinitro*-, diphenyl esters, A., 942.  
 3:4'-Diphenyl-2:2'-divinyldiquinazoline 1:1'-dimethiodide, A., 282.  
 4:4'-Diphenyl-2:2'-divinyldiquinoline, salts of, A., 282.  
 Diphenylene oxide, 1:3:6:8-tetranitro-, formation of, from acyl derivatives of 3:5:3':5'-tetranitro-2:2'-dihydroxydiphenyl, A., 1027.  
 6-nitro-2-amino-, A., 1140.  
 oxides, diamino-, and their diacetyl derivatives, A., 1140.  
 sulphide, preparation of, A., 730.  
 Diphenylenebisdiazonium fluoroborate, A., 729.  
 Diphenylene-6:9-dihydro-5:22-*di*hydroxy-acriquinolines, A., 754.  
 Diphenylene-*pp*-distibic acid, amino-, succinyl derivative, A., 867.  
 Diphenylene-*pp*-distibinous oxide, A., 866.  
 $\alpha$ -Diphenylenephthalide, A., 1032.  
 Diphenylenesulphones, halogeno-, formation of halogenodiphenyl-2-sulphonic acids from, A., 152.  
 $\alpha$ -Diphenylethane (*dibenzyl*), action of sulphur on, A., 940.  
 $\alpha\alpha$ -Diphenylethyl alcohol, and its chloride, absorption spectra of, A., 1122.  
*NN*-Diphenyl-*N*-ethylbenzamidine, and its picrate, A., 1242.  
 Diphenyl-*N*-ethylbenzamidines, and their salts, A., 386.  
 Di-( $\beta$ -phenylethyl)benzene, 4:6-*dinitro*-1:3-*di*- $\alpha\beta$ -*di*bromo-, isomeride of, A., 941.  
 $\alpha\alpha$ -Diphenylethylene, addition of maleic anhydride to, A., 56.  
 $\alpha\alpha$ -Diphenylethylene, 2-nitro-1:2-*di*- $p$ -nitro-, A., 730.  
 Diphenylethylenediamine, 4:4'-diamino-, diacetyl derivative, A., 867.  
 $\alpha$ -Diphenylethylenediamine, complex cobalt compounds of, A., 155, 840.  
 $\alpha\beta$ -Diphenylethyleneimines, stereochemistry of ring fission of, A., 609.  
 Di- $\beta$ -phenylethylhydrazine, and its hydrochloride, A., 942.  
 $\alpha\beta$ -Diphenylethylmethylaniline, and its hydrochloride, A., 854.  
 $\alpha\beta$ -Diphenylethyl methyl ketone, and its semicarbazones, A., 393.

- $\alpha\beta$ -Diphenylethyl  $\alpha$ -propyl ketone, and its semicarbazone, A., 393.
- $\alpha\beta$ -Diphenylethyl isopropyl ketone, and its semicarbazone, A., 393.
- 1:1-Diphenyl- $d$ -fructose, and its derivatives, A., 147.
- Diphenyl-green dyes, and their salts, A., 1028.
- Diphenylguanidine, commercial, variability of, B., 590.
- use of, in acidimetry and alkalimetry, A., 241.
- $\alpha\delta$ -Diphenyl- $\Delta^{\alpha\epsilon}$ -hexadiene, formation of, from cinnamyl chloride and magnesium, A., 730.
- $\alpha\delta$ -Diphenyl- $\Delta^{\alpha\epsilon}$ -hexadiene, A., 41.
- $\alpha\delta$ -Diphenylhexane, A., 730.
- sym.*-Diphenylhydrazodicarbonamide, *pp'*-diamino-, A., 867.
- 1:1'-Diphenyl-5:5'-hydrazotetrazole, and its derivatives, A., 1044.
- 2:2'-Diphenylimino-4:4'-diketo-3:3'-diphenyl-5:5'-dithiazolidylmethane, A., 758.
- Di-(3-phenyl-1-indenylene)methane, A., 270.
- Diphenylindole, hydroxy-, manufacture of derivatives of, (P.), B., 14.
- 1:3-Diphenylisindole, 1-hydroxy-, A., 1258.
- 2:3-Diphenylindone, 6-chloro-, A., 848.
- Diphenylmethane, synthesis of, A., 373.
- derivatives, dipole moments of, A., 677.
- Diphenylmethane, bromo-, *mono*- and *di*-chloro- and chlorobromo-hydroxy-, and their antibacterial action, A., 1026.
- 4:4'-*di*hydroxy-, hydrogenation of, catalytically, under pressure, A., 53.
- Diphenylmethane-4:4'-dialdehyde, and its derivatives, A., 1122.
- Diphenylmethane-*pp*-distibinous oxide, A., 867.
- Diphenylmethyl sulphide, A., 1027.
- 9:9-Diphenyl-2-methyl-10-anthrone-1-carboxylic acid, A., 274.
- NN'*-Diphenyl-*N*-methylbenzamidine, and its picate, A., 1242.
- Diphenyl-*N*-methylbenzamidines, and their salts, A., 386.
- Diphenylmethyl-2-benzhydrylbenzene, 1-hydroxy-, A., 158.
- $\alpha\beta$ -Diphenyl- $\beta$ -methyl- $\Delta\alpha\gamma$ -butadiene, and its  $\gamma\delta$ -dibromide, A., 506.
- r-aa*-Diphenyl- $\beta$ -methylbutanol,  $\beta$ -amino-, and its hydrochloride, A., 1126.
- $\delta\delta$ -Diphenyl- $\beta$ -methylbutan- $\gamma$ -one, A., 831.
- 2-(Diphenylmethyl)diphenyl-2'-carboxylic acid, 2-hydroxy-, stereoisomerism of, A., 849.
- Diphenylmethylenediamine, 4:4'-*di*amino-, diacetyl derivative, A., 867.
- Diphenylmethylenecyclopropane, A., 1249.
- Diphenyl-( $\gamma$ -methyl- $\gamma$ -ethyl- $\Delta\alpha$ -pentinyl)-carbinol, A., 496.
- Di-(2-phenyl-5-methylcyclohexyl)amine, *di*-2-hydroxy-, A., 395.
- 2:3-Diphenyl-6-methylindone, A., 848.
- Diphenylmethylmercuric chloride, chloro-, A., 937.
- 2-*aa*-Diphenylmethyl-naphthalene, 3-amino-1:4-*di*hydroxy-2-*a*-amino-, and its diacetate, A., 170.
- $\alpha\gamma$ -Diphenyl- $\beta$ -methyl- $\Delta\alpha$ -propylene, and its oxide, A., 393.
- 1:5-Diphenyl-3-methylpyrazole, and its picate, A., 169.
- 1:5-Diphenyl-3-methylpyrazolemethylammonium iodide, A., 169.
- 1:3-Diphenyl-5-methylpyrazoline, A., 283.
- 2:4-Diphenyl-3-methylpyrazolopyrrolid-6-one, A., 171.
- Diphenylmethyltriphenylcarbinols, A., 515.
- Diphenylmethyltriphenylmethane, *p*-hydroxy-, A., 746.
- Diphenylmethyltriphenylmethanes, A., 515.
- Diphenylmethyltriphenylmethyl peroxide, *p*-hydroxy-, A., 746.
- 1:4-Diphenyl-2-naphthaldehyde, and its oxime, A., 1257.
- 1:4-Diphenyl-naphthalene, and nitro-, A., 1257.
- 1:4-Diphenyl-naphthalene-2:3-dicarboxylic anhydride, A., 1257.
- Diphenyl- $\alpha$ -naphthapyrones, A., 520.
- 1:4-Diphenyl-2-naphthoic acid, and its methyl ester, A., 1257.
- Diphenyl- $\alpha$ -naphthylacetic acid, and its methyl ester, A., 572.
- Diphenyl- $\beta$ -naphthylethylcarbinol, and its ethyl ether, A., 260.
- aa*-Diphenyl- $\gamma$ - $\beta$ -naphthyl- $\Delta\beta$ -propinene,  $\alpha$ -chloro-, hydrochloride, A., 260.
- $\beta\gamma$ -Diphenyl- $\alpha$ -*p*-nitrophenylguanidine, A., 376.
- Diphenyl(*m*-nitrophenyl-2-hydroxy-1-naphthylmethyl)carbamide, A., 157.
- aa*-Diphenyl- $\Delta\alpha$ -nonene, A., 1114.
- Diphenyloxen, A., 63.
- 1:4-Diphenyl-1:4-oxido-1:2:3:4-tetrahydro-naphthalene-2:3-dicarboxylic anhydride, A., 1257.
- 3:3-Diphenyloxindoles, *mono*- and *di*-iodo-3:3-*di*-*p*-hydroxy-, and their acetyl derivatives, A., 1142.
- 9:10-Diphenylphenanthrene, preparation of, A., 1122.
- 3:8-Diphenyl-4:7-phenanthroline-1:10-dicarboxylic acid, and its silver salt, A., 755.
- NN'*-Diphenyl-*N*-phenylbenzamidine, *di*-*o*-chloro-, A., 846.
- Diphenyl-*p*-phenylenediamine, salts from, with triphenylmethyl chloride and fluoride, A., 263.
- 5-Diphenyl(phenyl-1- $\beta$ -hydroxynaphthylmethyl)carbamide, A., 52.
- $\alpha\beta$ -Diphenylpropaldehyde semicarbazone, A., 1246.
- 1:2-Diphenylcyclopropane, A., 606.
- $\alpha\gamma$ -Diphenylpropane,  $\alpha\gamma$ -*di*bromo-, A., 606.
- $\beta\gamma$ -Diphenylpropane- $\alpha\beta$ -diol, A., 1246.
- $\alpha\gamma$ -Diphenyl- $\Delta\beta$ -propene,  $\gamma$ -bromo-, and its dibromide, A., 606.
- $\alpha\beta$ -Diphenylpropionic acid, action of phosphorus pentachloride on, A., 1261.
- $\alpha\gamma$ -Diphenylpropionitrile,  $\beta$ -imino-, A., 738.
- aa*-Diphenylpropionyl chloride, A., 382.
- $\alpha\beta$ -Diphenylpropionyl chloride, A., 273.
- Di-( $\gamma$ -phenylpropyl)amine, *di*- $\beta$ -hydroxy-, and its hydrochloride, A., 394.
- Diphenyl-*n*-propylarsine, and its salts, A., 1120.
- $\alpha\gamma$ -Diphenyl- $\alpha\beta$ -propylene glycol, A., 392.
- $\alpha\gamma$ -Diphenyl- $\Delta\alpha$ -propylene oxide, A., 392.
- 1:1-Diphenyl-2:3-isopropylidene- $\alpha$ -fructofuranose, A., 147.
- 1:1-Diphenyl-2:3-isopropylidene-*d*-fructopyranose, A., 147.
- 1:3-Diphenylpyrazoline, preparation of, A., 721.
- 2:3-(3:3-Diphenyl- $\psi$ -pyrazolo-4:5)hydroquinone, and its salts and dimethyl ether, A., 170.
- 2:3-(3:3-Diphenyl- $\psi$ -pyrazolo-4:5)-1:4-naphthahydroquinone, and its salts and derivatives, A., 170.
- 2:3-(3:3-Diphenyl- $\psi$ -pyrazolo-4:5)-1:4-naphthaquinone, A., 170.
- Diphenylpyrophosphoric acid, enzymic fission of, A., 305.
- 2-Diphenylquinoline-4-carboxylic acid, 6-bromo-3-hydroxy-, A., 754.
- NN'*-Di-(2-phenylquinolyl-4)ethylenediamine, A., 623.
- Diphenylsemicarbazide, *di*-*p*-nitro-, A., 598.
- Diphenylstibinyl iodide, reaction of, with piperidine salt of *N*-pentamethylenedithiocarbamic acid, A., 953.
- Diphenylsulphone, *pp'*-*di*chloro-, A., 507.
- 2-nitro-, and 2-nitro-4'-hydroxy-, A., 735.
- Diphenyl-2-sulphonic acid, 4:4'-*di*bromo- and 4:4'-*di*chloro-, formation of, and their derivatives, A., 152.
- Diphenylsulphoxide, action of sodamide on, A., 730.
- Diphenylsulphoxide, *mono*- and *di*-chloro-, A., 507.
- 2:6-Diphenyltetrahydropyrene, A., 620.
- aa*-Diphenyl- $\beta\beta$ -tetramethyldiaminodiphenylethyl alcohol, A., 852.
- $\epsilon\zeta$ -Diphenyl- $\beta\beta$ -tetramethyldodecan- $\gamma\delta$ -dione, stereoisomerism of, A., 163.
- 3:3'-Diphenyl-1:3:1':3'-tetramethyl-2:2'-indocarbocyanine chloride, A., 288.
- Diphenylthiocarbamide, *mono*- and *di*-nitro-, A., 376.
- s*-Diphenylthiocarbamides, *di*-3-fluoro-, A., 154.
- 1:1-Diphenylthiol-2-methylethylene sulphide, A., 372.
- cis*- $\alpha\beta$ -Diphenyl- $\beta$ -*p*-tolylacrylic acid, A., 848.
- Diphenyl-*p*-tolylethynylcarbinol, and its derivatives, A., 260.
- $\alpha\beta$ -Diphenyl- $\alpha$ -*p*-tolylethyl alcohol, A., 848.
- $\alpha\beta$ -Diphenyl- $\alpha$ -*p*-tolylethylene, A., 848.
- Diphenyl-*m*-tolylmethane-*ppp*-tristibinous oxide, A., 867.
- Diphenyl-*m*-tolylmethylcarbinol-*ppp*-tristibinic acid, A., 867.
- 1:2-Diphenyl-4-*p*-tolyl-3-methylpyrazolopyrrolid-6-one, A., 171.
- Diphenyl-*p*-tolylselenonium salts, A., 181.
- $\alpha\beta$ -Diphenyl- $\beta$ -*p*-tolylvinyl bromide, A., 848.
- 2:4-Diphenyl-1:3:5-triazine-6-carboxylic leuco- $\alpha$ -anthraquinonylamide, (P.), B., 139.
- N*-*p*-Diphenyltriphenylmethylamine, A., 1240.
- 2-Diphenylcarbamide, A., 1041.
- $\alpha$ -*p*-Diphenylmethylamines. See  $\alpha$ -*p*-Xenyl-ethylamines.
- p*-Diphenyl-2-methyl-1-anthraquinonyl ketone, A., 274.
- 9-*p*-Diphenyl-2-methyl-9-oxanthrone(10)-1-carboxylic acid lactone, A., 275.
- 2-(4-Diphenyl)quinoline-4-carboxylic acid, 3-hydroxy-, A., 754.
- Diphenyl styryl ketone, and its derivatives, A., 617.
- 2:2'-Dipthalimidodiphenyl, A., 508.
- 1:4-Di-( $\beta$ -phthalimidoethyl)piperazine, and its dihydrobromide, A., 168.
- trans*- $\alpha\zeta$ -Dipthaloyl- $\beta\epsilon$ -*di*-*o*-carboxyphenyl- $\Delta\alpha\gamma$ -hexatriene, and its derivatives, A., 747.
- NN'*-Dipthaloyldinoreserethole, A., 287.
- 1:2:5:6-Dipthaloylnaphthalene, and its halogen derivatives, (P.), B., 672.
- trans*-*bisang*-Dipthalylanthraquinone. See Indoquinoncanthrene.
- 1:2:5:6-Dipthalylanthraquinone-4:4'-dicarboxylic acid, and its derivatives, A., 1136.
- Diphtheria antitoxin, adsorption of, by aluminium hydroxide, A., 1170.
- toxin, from cultures, A., 94.
- effect of carbohydrates on production of, A., 654.
- purification of, A., 197, 969.
- flocculation of, A., 197.
- acid precipitation of, A., 197.
- stabilisation of, A., 94.

- Diphtheria toxin, effect of aliphatic amines and amides on, A., 1170.  
 effect of benzene derivatives on, A., 1170.  
 action of sodium  $\alpha$ -hydroxy- $\beta$ -naphthoate on, A., 779.  
 toxicity and antigenic potency of, A., 779.  
 produced in synthetic media, A., 196.  
 toxoid, A., 1290.  
 effect of antiseptics on antigenic value of, A., 94.  
 precipitation of, with alum, A., 1170.  
*s*-Di-(picolinoyl)hydrazine, *di*-4:6-dichloro-, A., 401.  
 Dipicric acid. See 3:3'-Diphenol, 2:4:6:2':4':6'-hexanitro-.  
 Dipinenes, A., 62.  
*aa*-Dipiperidinobenzoylacetic acid, ethyl ester, A., 280.  
 Dipole liquids. See under Liquids.  
 Dipole moments, A., 984.  
 formula for calculation of, A., 9.  
 and molecular structure, A., 676.  
 and structure of organic compounds, A., 215, 718.  
 electrostatic energy of, A., 21.  
 and Raman effect, A., 445.  
 dependence of, on solution media, A., 1077.  
 of homologous alcohols, esters, and ketones, A., 8.  
 of aromatic compounds, angular values from, A., 794.  
 of colloids, A., 462.  
 of esters with hydrocarbon radicals, A., 9.  
 of molecules with several axes of rotation, A., 676.  
 of molecules with mutually independent dipole groups, A., 110.  
 1:1'-Dicyclopropane-2:2'-dicarboxylic acid, and its derivatives, A., 754.  
 Dipropionic acid, *aa*-imino-, and its hydrochloride, A., 49.  
*aa*-Di-(4-propionyl-3:5-dimethyl-2-pyrryl)-ethane, A., 1263.  
*s*-Di-( $\alpha$ -propoxyethyl)carbamide, *di*- $\beta\beta\beta$ -trichloro-, A., 151.  
 Di-*p*-propoxyphenylselenium dihydroxide, and its salts, A., 70.  
 Diisopropyl ether, as solvent in Grignard reaction, A., 728.  
 Di-*n*-propylaminobarbituric acid, 5-bromo-, A., 283.  
 Di-*n*-propylaminomethyl alcohol, esters, A., 845.  
 Dipropylammonium trithiocarbonate, A., 150.  
 Di-*n*-propylarsine, and its derivatives, A., 1120.  
 Di-( $\alpha$ -*n*-propyl-*n*-butyl)malonamide, A., 371.  
*aa*-Diisopropylbutyronitrile, A., 727.  
 1:1'-Disopropyl-2:2'-carbocyanine iodide, A., 282.  
 4:4-Dipropyl-3:5-diketopyrazolidine, A., 1143.  
 Dipropylcyclohexanones, formation of, and their derivatives, A., 162.  
 Disopropylidenechlorogenic acid, A., 850.  
 $\beta$ -Disopropylidenefructose, oxidation of, A., 144.  
 $\beta$ -Disopropylidenefructosephosphoric acid, esters, sodium derivatives, A., 1238.  
 Disopropylidene-glucose, potassium derivative, 3-sulphate, A., 148.  
 Dipropylmalonic acid, menthyl esters, A., 1083.  
 Disopropylmalonic acid, copper and sodium salts, A., 809.  
 NN'-Diisopropyl-*p*-phenylenediamine, and its derivatives, A., 154.  
 Dipropyl-1-phenyl-3-methylbarbituric acid, A., 283.  
 2:6-Di-*n*-propyl-4-pyridone, and its salts and hydrate, A., 1256.  
 2:6-Di-*n*-propyl- $\gamma$ -pyrone, synthesis of, and its salts, A., 1255.  
 2:6-Dipropyl-1:3:5:7-tetraketopyrazo-(1:2-*a*)-pyrazole, A., 1143.  
 Dipropylthalliumacetylacetone, A., 1269.  
 NN-Dipropylthiocarbamic acid, ferric salts, magnetic susceptibility of, A., 678.  
 Di-*n*-propylthiomethane, A., 1114.  
*Dipsacus fullonum*, oil of, B., 994.  
 5:5'-Dipyrzoline, and its salts, A., 754.  
 5:5'-Dipyrzoline-3:3'-dicarboxylic acid, derivatives of, A., 754.  
 Dipyridinodiquinodiplatinous chlorides, A., 1039.  
 $\alpha$ -Dipyridinoplatinous chloride, A., 1039.  
 Dipyridyl, and its salts and nitro-, A., 177.  
 Dipyridyls, A., 755.  
 Dipyridyl series, coloured salts of, A., 170.  
 Di-3-pyridylarsinic acid, A., 761.  
 Di-3-pyridylchloroarsine dihydrochloride, A., 761.  
 Dipyrrol diketones, A., 285.  
 Di-2-pyrrylphosphinic acid, A., 954.  
 Di-(quinoline-3-azo)-di-*o*-anisyl, *di*-2:4-di-hydroxy-, A., 623.  
 Di-(quinoline-3-azo)-*pp'*-diphenyl, *di*-2:4-di-hydroxy-, A., 623.  
 Di-(quinoline-3-azo)-di-*o*-tolyl, *di*-2:4-di-hydroxy-, A., 623.  
 Diquinoloplatinous chlorides, and their derivatives, A., 1039.  
 Diquinolylmethane, 6':6'-dihydroxy-, and its hydrochloride and diacetyl derivative, A., 1262.  
*s*-Di-( $\beta$ -2-quinolylpropion)hydrazide, A., 167.  
 Disaccharides, constitution of, A., 255, 835.  
 Raman spectra of, A., 559.  
 alkaline degradation of, A., 148.  
 enzymic hydrolysis of, A., 649.  
 Disazo-compounds, acetylated derivatives of, for use as antiseptics, etc., (P.), B., 1137.  
 Disazo-dyes, manufacture of, (P.), B., 498, 975.  
 containing sulphur, manufacture of, (P.), B., 765.  
 for regenerated cellulose materials, manufacture of, (P.), B., 58.  
 for wool, manufacture of, (P.), B., 176.  
 substantive, from 1:5-diaminoanthraquinone, B., 174.  
 Disazonaphthols, azo-sulphites of, and their fission, A., 609.  
 Disease, relation of food to, B., 750, 958.  
 enzymes as a protection against, B., 622.  
 infectious, liver-lipins in, A., 769.  
 Diselenobenzoic acid, benzylidene ester, A., 382.  
 Diselenoricinic acid, A., 526.  
 Disilane, hexafluoro-, A., 482.  
 Disinfectants, (P.), B., 578, 1058.  
 manufacture of, (P.), B., 530, 960, 1010\*, 1104.  
 apparatus for automatic addition of, to water in cisterns, etc., (P.), B., 162.  
 testing of, B., 401.  
 pine oil, properties of, B., 402.  
 Disinfection by alkalis, effect of salts on, A., 431.  
 Disinomenine, A., 1048.  
 Disintegration, photography of, by collision, A., 672.  
 Disintegration apparatus, (P.), B., 85, 1012.  
 clay ball, (P.), B., 661.  
 Disperse systems. See under Systems.  
 Dispersing agents, manufacture, of (P.), B., 56, 138, 173, 221, 252, 332, 540, 592, 671, 792, 793, 973, 1071, 1072, 1114.  
 for dyes, etc., (P.), B., 671.  
 Dispersion, influence of solvents and temperature on, A., 679.  
 anomalous, of excited gases, A., 1.  
 electrical anomalous, of polar solutions, A., 570.  
 rotatory, theory of, A., 448.  
 of organic compounds, A., 1254.  
 Dispersions, manufacture of, (P.), B., 301.  
 aqueous, production of, (P.), B., 756.  
 Dispersoids, apparatus for analysis of, A., 593.  
 Dissociation constants of acids, A., 124.  
 of fatty acids, A., 572.  
 of multivalent acids and bases, determination of, A., 24.  
 of organic acids, A., 342.  
 Dissociation pressures, measurement of, A., 1204.  
 Distillation, (P.), B., 2, 86, 371.  
 of liquids, (P.), B., 4.  
 of ternary heterogeneous mixtures, A., 687.  
 destructive, apparatus for, (P.), B., 490.  
 fractional, B., 820, 1107.  
 micro-, flask for, A., 1226.  
 low-pressure, (P.), B., 4.  
 micro-, A., 37.  
 vacuum, (P.), B., 86.  
 apparatus for pressure control of, A., 925.  
 purification of materials by, A., 593.  
 vacuum micro-, A., 1013.  
 Distillation apparatus, A., 828; (P.), B., 4, 86, 662, 663, 756, 788, 1013, 1061.  
 design of, B., 963.  
 trap for, A., 1226.  
 maintenance of constant gas pressure in, (P.), B., 1109.  
 anti-foam still-head, A., 593.  
 column, (P.), B., 581.  
 dephlegmation, (P.), B., 532.  
 fractional, (P.), B., 373, 581, 1012.  
 control of, B., 211.  
 for diminished pressure, A., 246.  
 tower, (P.), B., 822.  
 laboratory, (P.), B., 486, 1061.  
 for water, etc., (P.), B., 1108.  
 glass, A., 138.  
 Pintsch, B., 660.  
 reflux, (P.), B., 86.  
 tower, filling for, (P.), B., 756.  
 vacuum, A., 358; (P.), B., 1108.  
 Distilleries, continuous diffusion by "Olier" system in, B., 280, 747.  
 power and fuel gas from wastes from, B., 326.  
 souring of potatoes in, B., 619.  
 $pH$  of potato mashes in, B., 280.  
 Distillery slop, comparison of, prepared by different methods, B., 159.  
 Distychnidyl. See Didehydrostrychnidine.  
 1:3-Distyrylbenzene, 4:6-dinitro-, salts of, and 4:6-dinitro-1:3-di-*a*-chloro-, A., 176.  
 halogen derivatives of, and their transformation into isatogens, A., 941.  
 Distyryl ketone, A., 383, 1132.  
 Distyryl ketoxime, rearrangement of, A., 387.  
 2:2'-Disuccinimidodiphenyl, and its dinitro-derivatives, A., 608.  
 $\kappa$ -Disulphidoundecoic acid, A., 408.  
 2:2'-Disulphodiphenyldisazobis- $\beta$ -naphthyl sodium sulphite, A., 610.  
 Disulphomethanethiosulphuric acid, potassium salt, reaction of, with mercuric oxide, A., 1233.



Diterpene,  $C_{20}H_{32}$ , from oil of *Sciadopitys verticillata*, B., 321.

2:4-Di(*O*-tetra-acetyl- $\beta$ -glucosidyl)-phloroglucinaldehyde, A., 1141.

2:2'-Ditetrahydrodinaphthyls, dinitro-, A., 153.

Ditetrahydrostrychnyl. See Didehydro-tetrahydrostrychnine.

cyclo-2:5-Dithia-3:4-dimethylenestibine, derivatives of, and 1-chloro-, A., 867.

cyclo-2:5-Dithia-3:4-dimethylenestibine-1-thiolacetic acid, pyridine salt, A., 867.

Di- $\beta$ -thienylacryloylacetone, A., 1259.

Di- $\beta$ -thienylacryloylmethane, synthesis of, A., 1259.

Di-2-thienylarsinic acid, di-5-iodo-, A., 630.

Dithio-acids, conversion of, into aldoximes, A., 743.

formation of thiol and sulphonic acids from, A., 367, 932.

action of phenylmethylhydrazine on, A., 51.

Dithionates. See under Sulphur.

3:4-Di-*p*-toluenesulphonyl-2:6-dimethyl- $\beta$ -methylglucoside, A., 500.

$\alpha$ -Di-*p*-toluenesulphonyl-*d*-mannitol  $\beta$ - $\delta$ -tetrabenzoate, A., 920.

3:4-Di-*p*-toluenesulphonyl-2-methyl- $\beta$ -methylglucoside, and its 6-nitrate, and 6-iodo-, A., 500.

2:5-Di-*m*-toluidinocyclohexadiene-1:4-dicarboxylic acid, ethyl ester, A., 754.

Ditoluoyl mono- and di-sulphides, A., 55.

$\alpha$ -Di-*p*-toluoylbutane,  $\alpha$ - $\delta$ -dibromo-derivatives, A., 63.

2:2'-Di-*p*-toluoyldiphenyl, A., 745.

Ditolyl. See Dimethyldiphenyl.

Ditriethylgermaniumimine, A., 606.

$\alpha$ -Di-(1:1:3-trimethyl-2-cyclohexyl)- $\gamma$ -dimethyl-*n*-decane, A., 853.

Ditriphenylgermanylmethane, A., 629.

1:2-Di(triphenylmethyl)mannitol 2:3:4:5-tetrabenzoate, A., 834.

1:6-Ditriphenylmethylmannitol 2:3:4:5-tetraacetate, A., 369.

$\alpha$ -Ditriphenylmethylmannitol  $\beta$ - $\delta$ -tetrabenzoate, A., 929.

$\alpha$ -Ditriphenylmethyl- $\gamma$ - $\delta$ -isopropylidene-*d*-mannitol  $\beta$ - $\delta$ -diacetate, A., 929.

Diuresis, effect of bismuth salts on, A., 961.

Diuretics, action of, on colloidal osmotic pressure, A., 301.

Diuretic, determination in, of theobromine, B., 1136.

Divinyl sulphoxide,  $\beta$  $\beta'$ -dibromo-, and  $\beta$  $\beta'$ -dichloro-, A., 1233.

Divinylacetylene, A., 40.

Divinyl glycol, A., 718.

2:2'-Divinylquinoline 1:1'-diethiodide, A., 282.

Divomicyl. See Didehydrovomicine.

Divulson-D, fat splitting power of, B., 269.

2:5-Di-1:3:4-xylylidinocyclohexadiene-1:4-dicarboxylic acid, ethyl ester, A., 754.

Dixylosyl disulphide, and its hexa-acetate, A., 45.

Di-*m*-xyloylanthracene, A., 1136.

2:6-Di-*m*-xyloylanthraquinone, A., 1136.

Dixylenedipiperidinium salts, A., 524.

Di-*p*-xylylformamidine, reactions of, A., 508.

Documents, preservation of, B., 499.

illegible, rendering of, legible, A., 244.

detection of forgeries on, B., 380.

$\Delta$  $\Delta$ -Dodecadiene, A., 149.

Dodecahydrochrysene, A., 730.

Dodecahydrophenazines. See Bistetramethylenepiperazines.

Dodecaldehyde, and its preparation and additive compounds, A., 44.

Dodecamethylenephthalamic acid,  $\mu$ -cyano-, A., 1118.

Dodecamminehexoltetracobaltic thiosulphate. See under Cobalt.

Dodecane,  $\alpha$  $\mu$ -diamino-, quaternary salt from, A., 149.

$\Delta$  $\Delta$ -Dodecenaldehyde, and its derivatives, A., 721.

$\Delta$  $\Delta$ -Dodecenoic acid, derivatives of, A., 722.

*n*-Dodecoic acid,  $\alpha$  $\beta$ -dihydroxy-, A., 722.

Dodecylol, rotating and fixed forms of, A., 987.

$\alpha$ -*n*-Dodecyl-*n*-tetradecoic acid, and its tri-bromoanilide, A., 720.

Dogs, fasting, excretion of nitrogen and sulphur by, A., 1162.

Dog fat, B., 735.

Dolomite, genesis of, A., 1106.

removal of calcium from, (P.), B., 305.

production and separation of lime and magnesia from, (P.), B., 505.

production of magnesia and calcium nitrate from, (P.), B., 934.

of the Kerchensk Peninsula, A., 1228.

Donovan's solution U.S.P.X., stabilisation of, B., 577.

Dopa-oxidase, optical specificity of, A., 1165.

Dopes, benzylcellulose, B., 436.

"Doronoki," digestion of wood of, B., 1022.

Dotriacontane, heat of combustion of, A., 229.

Dough, production of, (P.), B., 405, 526.

treatment of, (P.), B., 1006.

moulding of, (P.), B., 816.

effect of temperature and dry skim-milk on properties of, B., 1052.

$pH$  of, and its determination, B., 481.

fermentation of, B., 77, 481.

production of food products from, for reception of sandwich fillings, (P.), B., 912.

for bread, effects of sugar in, on fermentation, B., 860.

Dressings, surgical. See Surgical dressings.

Driers, classification of metals as, B., 735.

prevention of sedimentation of solutions of, (P.), B., 315.

effect of, on properties of linseed oil paint films, B., 649.

for oils, paints, varnishes, etc., (P.), B., 517.

for paints, oils, etc., (P.), B., 355.

Drills, rotary, treatment of liquids for, B., 969.

Drops, electrical counter for, A., 138.

*Drosophila* imago, respiration of, A., 1150.

Drugs, preparation of extracts of, B., 400.

production of tablets containing, (P.), B., 708.

copper numbers of, B., 862.

toxic and lethal doses of various, for mice and frogs, A., 963.

effect of, on purine economy, A., 1162.

alkaloidal, assay of, B., 576.

antirheumatic, effect of, on calcium and potassium equilibrium, A., 879.

Chinese antidiabetic, A., 541, 877, 1284.

mydriatic, removal of volatile bases in assay of, B., 1054.

vegetable, saponins in, B., 1136.

microchemical reactions for, in plant tissues, A., 978.

chick-heart method for biological assay of, B., 702.

determination in, of ash, B., 1136.

of essential oils, B., 1137.

determination of origin of extracts of, by capillary analysis, B., 1136.

Dry-cleaning, plant for, (P.), B., 722.

composition for, (P.), B., 504.

purification of solvents for, (P.), B., 252, 504.

use of soap in, B., 797.

Dryers, (P.), B., 531, 579, 628, 660, 820.

control of, (P.), B., 452.

performance of, B., 1011.

cleaning of heating surfaces of, when heated by oil-containing steam, (P.), B., 212.

vacuum pans for, (P.), B., 532.

for gases, (P.), B., 87.

centrifugal, steam, (P.), B., 2.

rotary, (P.), B., 163, 324.

spray, (P.), B., 628.

for liquids and semi-liquid materials, (P.), B., 1060.

vertical, Jenkins, B., 451.

Drying, B., 707.

theory of, B., 1107.

of crops, cut grass, fibrous materials, etc., (P.), B., 163.

of cellulose or starchy materials, (P.), B., 16.

of materials, (P.), B., 2, 916.

by spraying, (P.), B., 820.

of granular materials, (P.), B., 452, 916.

of road-making materials and granular materials, (P.), B., 243.

of solids, B., 451.

application of diffusion equations to, B., 403.

of porous solids, diffusion and surface-emission equations for, B., 403.

high-temperature, steam-heating installations for, (P.), B., 2.

intensive, rates of condensation and evaporation in, A., 569.

spray, by the Krause process, B., 83.

two-stage, with reversed currents, B., 371.

Drying apparatus, (P.), B., 2, 163, 404, 485, 486, 820, 1012.

heating of, (P.), B., 916.

drainage-bucket system for, (P.), B., 579.

circulation of materials in, (P.), B., 84.

for air and gases, (P.), B., 663.

for gases, (P.), B., 917.

for grain, etc., (P.), B., 532.

for knitted goods, (P.), B., 179.

for liquid or pulpy materials, (P.), B., 660.

for wood, etc., (P.), B., 485.

rotary, lifting baffles for, (P.), B., 374.

vacuum, straining device for, (P.), B., 452.

for products with low vapour pressure, B., 291.

Ducks, dressed, spoilage of, by sliminess, B., 1005.

Dulcitol, X-ray structure of, A., 904.

in marine algae, A., 101.

Dulit wood, Philippine, composition of, B., 773.

Dumortierite in Bhandaria district, India, A., 247.

Dnodenum, relation of mucosa of, to pancreatic secretion, A., 780.

Duralplat, mechanical and corrosion tests on sheets of, B., 510.

corrosion of, in 2 years in the North Sea, B., 941.

Duralumin, strength of, at high temperatures, B., 1034.

changes in hardness of, B., 606.

ageing and tempering of, B., 387.

influence of cold work on age hardening of, B., 510.

intercrystalline corrosion of, B., 429.

Durene, bromo-derivatives of, A., 717.

*n*- and *iso*-Durenes, separation of, A., 607.

Dust or Dusts, preparation of, for the microscope, A., 828.  
 electrical properties of, A., 993.  
 removal of, from air, (P.), B., 581.  
 from air and gases, (P.), B., 756.  
 apparatus for, (P.), B., 1062.  
 from gases, (P.), B., 581.  
 apparatus for, (P.), B., 293.  
 from flue gases, B., 915.  
 from mine air, B., 210.  
 collectors for, (P.), B., 917.  
 cyclone collectors for, B., 484.  
 bags for collection of, in vacuum cleaners, (P.), B., 662.  
 apparatus for collection of, from cement kilns, etc., (P.), B., 292.  
 filters for, (P.), B., 823.  
 separators for, (P.), B., 1062.  
 centrifugal separators for, (P.), B., 244.  
 yellow, at Bucharest, A., 829.  
 determination of, in air, B., 531.  
 Dwarfs, white, elements in, A., 106.  
 Dyes, manufacture of, and their application, (P.), B., 333.  
 from heterocyclic nitrogen compounds, (P.), B., 14, 57.  
 materials for plant for, B., 1072.  
 finely-divided, (P.), B., 879.  
 and their intermediates, (P.), B., 1021.  
 intramolecular rearrangement and electric charges of, A., 295.  
 constitution and colour intensity of, A., 444.  
 visual spectrophotometry of, B., 879.  
 transmission spectra of, in the solid state, A., 674.  
 broad absorption and fluorescence bands in spectra of solutions of, A., 213.  
 photoanisotropic effect with, A., 1214.  
 rôle of, in photo-electric effects, A., 898.  
 sensitisation of photographic emulsions by, A., 1214.  
 fastness of, to light, B., 596.  
 fading of, B., 497.  
 fastness of, on vegetable fibres, B., 336.  
 adsorption of, on charcoal, diamond and artificial silk, A., 908.  
 by salts, A., 118.  
 from aqueous solutions by Japanese acid clays, A., 332.  
 adsorbed fluorescing, phosphorescence of, A., 446.  
 surface tension of, A., 690, 993.  
 compounds for dissolving of, (P.), B., 928.  
 improvement of solubility of, (P.), B., 139.  
 dispersing agents for, (P.), B., 671.  
 effect of electrolytes on fixation of, by colloids, A., 693.  
 action between excited molecules of, and oxygen, A., 7.  
 reactions between proteins and, A., 227.  
 manufacture of intermediates for, (P.), B., 928.  
 relation between formation of, in plants, and physiological activity, A., 101.  
 as fungicides for plants, B., 955.  
 relation between  $p_H$  and bactericidal action of, A., 652, 1171.  
 action of, on enzymes, A., 1287.  
 solutions of, for therapeutic use, (P.), B., 1115.  
 excretion of, in diuresis, A., 535.  
 in gastric juice, A., 534.  
 resorption of, by the gastric mucous membrane, A., 773.  
 inhibition of retention of, by liver, A., 1285.

Dyes, dermatitis caused by, B., 637.  
 for cotton printing, (P.), B., 834.  
 for hair, (P.), B., 798.  
 for wool for bathing purposes, B., 98.  
 for wool, silk, or leather, manufacture of, (P.), B., 1073.  
 containing copper, detection of, in hair, B., 502.  
 containing metals, manufacture of, (P.), B., 58.  
 for viscose silks, (P.), B., 58.  
 acid, for wool, manufacture of, (P.), B., 14.  
 antihalation, manufacture of, and their application, (P.), B., 301, 497.  
 basic brown, for wool, manufacture of, (P.), B., 1021.  
 Brazilian vegetable, B., 676.  
 coal-tar, effect of white pigments on light fastness of, B., 851.  
 toxicity of, to silk-worms, B., 1130.  
 for foods, determination of, electro-metrically, B., 253.  
 impure, preparation of optically identical solutions of, A., 1008.  
 photosensitising, manufacture of, (P.), B., 673, 765.  
 rapid fast, sightening of, B., 303.  
 soluble, manufacture and use of, (P.), B., 879.  
 sulphur, manufacture of, (P.), B., 174, 1021.  
 black, manufacture of, (P.), B., 96, 497.  
 oxidation of, B., 139.  
 blue, A., 525.  
 from indophenols, (P.), B., 494.  
 blue and blue-violet, manufacture of, (P.), B., 333.  
 vat, manufacture of, (P.), B., 498, 593.  
 from *o*-diamines and naphthalene-tetracarboxylic dianhydride, (P.), B., 497, 672.  
 from fluoranthene, (P.), B., 1073.  
 from 3-fluoro-2-aminoanthraquinone, (P.), B., 793.  
 from glyoxylidenebisanthrones, (P.), B., 672.  
 and their intermediates, (P.), B., 175.  
 and their formation from azo-dyes, A., 264.  
 light-fastness of, B., 1021.  
 dehalogenation of, (P.), B., 15.  
 dyeing, printing, etc., with, (P.), B., 418.  
 production of resists under, (P.), B., 19.  
 manufacture of pastes from, (P.), B., 498.  
 manufacture of preparations of, (P.), B., 637.  
 for textile printing, manufacture of, (P.), B., 1021.  
 halogenated, and their intermediates, manufacture of, (P.), B., 254.  
 determination of sulphur dyes in, B., 139.  
 determination of, volumetrically, with sodium hyposulphite, B., 834.  
 determination of intermediates for, by chromic acid oxidation, B., 590.  
 determination of substantivities of, B., 257.  
 Dye vats, (P.), B., 1076.  
 with acid-proof linings, (P.), B., 419.  
 for loose goods, (P.), B., 418.  
 Dyeing, apparatus for rotating hanks in, (P.), B., 61.  
 jiggers for, (P.), B., 381, 419.  
 use of ammonium sulphate in, B., 838.

Dyeing, Japanese tannins for, B., 1127.  
 with alizarin lake, B., 417.  
 with aniline black, B., 839; (P.), B., 883.  
 in a sulphide bath with azo-dyes, (P.), B., 979.  
 with blue vat dyes, (P.), B., 797.  
 with "folha-de-bolo" and other Brazilian vegetable dyes, B., 676.  
 Dyeing, with ice colours, (P.), B., 337, 931, 978.  
 with indanthrene dyes, action of wetting agents in, B., 60.  
 with indigo, (P.), B., 1117.  
 with mordant dyes, (P.), B., 544.  
 with polymethine dyes, (P.), B., 14.  
 with soluble dyes, (P.), B., 879.  
 with sulphur dyes, (P.), B., 978.  
 with vat dyes, (P.), B., 226, 418, 839, 1026.  
 of acetate silk with suspension dyes, B., 1075.  
 of bone, (P.), B., 337.  
 of celluloid articles, (P.), B., 769.  
 of cellulose, B., 143.  
 of cellulose acetate fabrics, (P.), B., 337.  
 of cellulose acetate silk materials, B., 178.  
 of cellulose esters with azo-dyes, (P.), B., 932.  
 of cellulose esters and ethers, (P.), B., 99, 179, 257, 337, 931, 1076.  
 of cotton, B., 675, 1116.  
 theory of, B., 253.  
 of cotton and wool with basic substantive dyes, B., 978.  
 of crepe paper, (P.), B., 144.  
 of dress velvets, B., 1117.  
 of fabrics, (P.), B., 338.  
 dye jigs for, (P.), B., 597.  
 with fast-to-rubbing naphthol AS dyes, B., 721.  
 with vat dyes, (P.), B., 596.  
 containing cellulose ester and cotton, (P.), B., 99.  
 of fabrics, tiles, etc., with water-soluble dyes, (P.), B., 839.  
 of fibres in violet and blue with ice colours, (P.), B., 932.  
 of fibres, viscose and artificial silk with acid and chrome dyes, B., 978.  
 of fibres and films of cellulose esters, (P.), B., 932.  
 of furs, hairs, skins, and leather, (P.), B., 503.  
 of hair, (P.), B., 798.  
 of hosiery, prevention of shady dyeings in, B., 839.  
 of materials containing cellulose derivatives, (P.), B., 503.  
 of mercerised cotton and viscose silk with sulphur dyes, B., 544.  
 of paper, B., 178.  
 influence of  $p_H$  on, B., 676.  
 of regenerated cellulose materials, (P.), B., 99.  
 of rugs, etc., *in situ*, (P.), B., 19.  
 of silk fabrics, (P.), B., 721.  
 of textiles, (P.), B., 544.  
 compositions for, (P.), B., 1026.  
 of textile fabrics, (P.), B., 257.  
 aluminium rollers for use in, (P.), B., 227.  
 of textile fibres with fast dyes, (P.), B., 1026.  
 of textile and cellulose materials, (P.), B., 61.  
 of textile materials, (P.), B., 99, 1076.  
 in flocks or bundles, (P.), B., 883.  
 containing cellulose esters or ethers, (P.), B., 144, 839, 883, 932.

**Dyeing**, of viscose silk, B., 639.  
 in blue to blue-violet shades, (P.), B., 1076.  
 in fast green tints, (P.), B., 769.  
 of viscose yarn, B., 417.  
 of wool, B., 544, 838.  
 reserve salts for, (P.), B., 1117.  
 in fast tints, (P.), B., 418.  
 with insoluble azo-dyes, B., 676.  
 of woollen fabrics with production of tone-in-tone effects, (P.), B., 769.  
 of yarns, B., 931.  
 in package or wound form, (P.), B., 418.  
 of yarn packages, (P.), B., 337.  
 beam, with vat dyes, B., 721.  
 cold, with azo-dyes, B., 143.  
 discharge, (P.), B., 226.  
 of materials containing cellulose derivatives, (P.), B., 839.  
 fast, with ester salts of leuco-vat dyes without steaming, (P.), B., 797.  
 inchoate, of textile articles, (P.), B., 676.  
 mordant, with alizarin dyes, (P.), B., 19.  
 reserve, of wool or silk, (P.), B., 1076.  
 spray, B., 61.  
**Dyeing apparatus**, (P.), B., 798, 1076.  
**Dyeing machines**, B., 721; (P.), B., 99, 179, 677.  
 use of monel metal in, B., 639.  
 for textile fibres in hank form, etc., (P.), B., 979.  
 for yarns, (P.), B., 979.  
 for hanks of yarn, (P.), B., 504, 883.  
**Dysentery**, Shiga, toxin of, A., 1290.

## E.

**Earth**, composition of the, A., 1107.  
**Earths**, adsorbent, treatment of, to increase their efficiency, (P.), B., 1028.  
 basaltic black and red, of Indo-China, B., 653.  
 bleaching, B., 243.  
 for mineral oils, B., 969.  
 diatomaceous, A., 359.  
 fullers', hydrolytic activity of, as a measure of its decolorising power, B., 259.  
 activation of, in cracking of oils, (P.), B., 712.  
 montmorillonite in, A., 1228.  
 spent, revivification of, (P.), B., 93.  
 New Zealand, bleaching of tallow with, B., 69.  
 loose, solidification of, (P.), B., 508.  
 rare, A., 31.  
 in periodic system, A., 894.  
 higher valency in, A., 584.  
 absorption spectra of, A., 557.  
 near infra-red absorption spectra of, A., 445.  
 intensity ratios in spectra of, A., 1184.  
 spectra and quantum states of salts of, A., 211.  
 cando-luminescence of, A., 446.  
 cathodic phosphorescence of, in calcium oxide, A., 321.  
 basicity of, A., 696.  
 salts, magnetic birefringence of, A., 909.  
 paramagnetic susceptibility of, A., 985.  
 gyromagnetic ratio for, A., 325.  
 anhydrous chlorides of, A., 584.  
 halides of, A., 30, 1194.

**Earths**, rare, absorption spectra of nitrates of, A., 319.  
 physical chemistry of sulphates of, A., 470, 894.  
 double sulphates of alkali metals and, A., 132.  
**Earthenware**, English, crazing of, B., 228.  
 determination in, of lead, B., 841.  
**Ebonite**, B., 156.  
 products of destructive distillation of, B., 902.  
 manufacture of paving blocks from stone chippings and, (P.), B., 520.  
 vulcanisation of, in boiling water and in calcium chloride solutions, B., 156.  
 dust, production of, B., 1092.  
**Ebullioscope**, differential, A., 36.  
 differential multiple condensation, A., 1226.  
*Echidna aculeata*, composition of blood and urine of, A., 295.  
*Echinus*, eggs of. See under Eggs.  
 Echitamidine, from *Alstonia* barks, and its salts, A., 1267.  
 Echitamine, from *Alstonia* barks, and its derivatives, A., 1267.  
**Eclampsia**, A., 768.  
 serum-calcium in, A., 1159.  
 blood-inorganic sulphate in, A., 1158.  
 urinary proteins in, A., 873.  
**Eczema**, toxicity of serum in, A., 418.  
 cure of, with bile salts, A., 634.  
**Effluents**, packing-house, precipitation of proteins in, B., 450.  
**Eggs**, examination of, B., 399.  
 permeability of shells of, A., 294.  
 preservation of, (P.), B., 286, 622.  
 effect of cottonseed meal, etc., on storage quality of, B., 445.  
 iodine in, B., 284.  
 amphibian, preservation of stained paraffin sections of, A., 532.  
*Echinus*, fertilisation in, A., 1285.  
 fertilised and unfertilised, oxygen consumption by, A., 82.  
 fresh and preserved, differentiation of, B., 399.  
 hen's, osmotic relations in, A., 76, 1153, 1274.  
 water content of white and yolk of, A., 539.  
 survival of embryonic tissues of, at low temperatures, A., 419.  
 amino-acids in, during development, A., 419.  
 rôle of fat in development of, A., 1283.  
 changes in fats in incubation of, A., 874.  
 fluorescent substances in eggs of, A., 416.  
 formation and behaviour of proteins in, A., 1274.  
 vitellin of, A., 294.  
 effect of chloroform on, A., 646.  
 measurement of deterioration of, during storage, B., 205.  
 incubated, glycogen in, on sugar injection, A., 298.  
 sea-turtle's, egg-vitellin during incubation of, A., 876.  
 sea-urchin's, action of cations on membrane-forming function in, A., 964.  
 permeability and cytolysis of, A., 1285.  
 silkworm's, development of, A., 1283.  
 effect of irradiation on, A., 542.  
 trout's, vital staining of, A., 637.  
 washed, detection of, B., 1005.  
 determination in, of acid-soluble phosphoric acid, B., 160.

**Egg-white**, physical chemistry of ageing of, B., 1102.  
 liquefaction of, during storage, B., 205.  
 dried or liquid, production of, (P.), B., 526.  
 determination of solid matter and density of, B., 861.  
**Egg-yolk**, composition and activity of preparations of, A., 537.  
 proteins of, A., 957.  
 vitamin-A in, A., 781.  
 vitamin-B in, A., 973.  
 vitamin-D in, from irradiated hens, A., 1294.  
 determination of colouring matter of, B., 284.  
*Eichornia crassipes*, celluloses of, A., 436.  
**Eicos-n-nonylamide**, A., 1138.  
**Eigenfunctions**, equivalent chemical linkings formed by, A., 896.  
**Ekatantalum**. See Protoactinium.  
**Elæostearic acid**, detection of, B., 850.  
**Elæostearic acids**, doubly conjugated systems in, and their compounds with maleic anhydride, A., 1018.  
**Elaidic acid**, autooxidation of, A., 931.  
**Elaidin reaction**, A., 1111.  
**Elaidodibromostearic acid**, constitution of, A., 252.  
**Elasmobranchs**. See under Fish.  
**Elastic materials**, tensile and elongation tests on, (P.), B., 213.  
**Electric arc**, formation of, A., 1072.  
 mechanism of, A., 208.  
 transport of material in, A., 316.  
 excitation and ionic motions in, A., 787.  
 liquid for extinguishing of, (P.), B., 1089.  
 between carbon and insulators, A., 667.  
 mercury, apparatus for, (P.), B., 776.  
 capillary, A., 37.  
 vacuum, metal electrodes for, A., 1184.  
 arc and spark in histospectrography, A., 533.  
 birefringence, stroboscopic measurement of, A., 678.  
 contacts, element for, (P.), B., 804\*.  
 palladium-nickel alloys for, (P.), B., 847.  
 condensers. See under Condensers.  
 conductors, insulation of, (P.), B., 232, 433.  
 prevention of electrolytic corrosion of, (P.), B., 558.  
 insulated, (P.), B., 115.  
 discharge, chemical action of, A., 130, 820.  
 in gases, A., 439.  
 negative photo-effects in, A., 237.  
 at low pressures, A., 1072.  
 in liquids, A., 580, 1097.  
 arc, apparatus for, (P.), B., 945.  
 in water, A., 1097.  
 brush, reactions in, A., 130.  
 corona, spectrum of, A., 979.  
 electrodeless, A., 440.  
 glow, mass of positive ions in, A., 4.  
 spectra at cathodes of, A., 552.  
 energy of positive ions at cathode in, A., 1073.  
 chemical action in, A., 130, 1097.  
 high frequency, in gases, A., 315.  
 devices, (P.), B., 115, 611, 945, 992.  
 cathodes for, (P.), B., 945.  
 electrodes for, (P.), B., 1038.  
 electrode structure for, (P.), B., 733.  
 production of high vacua in, (P.), B., 646.  
 introduction of barium into, (P.), B., 432.  
 gas-filled, (P.), B., 114, 776.  
 electrodes for, (P.), B., 352.  
 luminous, (P.), B., 776.

Electric discharge, devices, gaseous, (P.), B., 192.  
 electrodes for, (P.), B., 992.  
 ultra-violet, (P.), B., 113.  
 glow, (P.), B., 390.  
 metal vapour, (P.), B., 611, 944.  
 mercury-vapour, (P.), B., 28.  
 neon filled, (P.), B., 992.  
 lamps, (P.), B., 514, 685.  
 control of light emission of, (P.), B., 559.  
 for picture recording, television, etc., (P.), B., 647.  
 daylight, (P.), B., 28.  
 rare-gas, manufacture of, (P.), B., 558.  
 tubes, (P.), B., 113, 232, 353, 804, 898.  
 cleaning up of, (P.), B., 433.  
 cathodes for, (P.), B., 114.  
 cathode carrier for, (P.), B., 354.  
 indirectly heated incandescence cathodes for, (P.), B., 353, 733.  
 carburisation of electrodes of, (P.), B., 733.  
 for emission of ultra-violet rays, (P.), B., 192, 432.  
 scaling of wires into, (P.), B., 515.  
 introducing alkali metals into, (P.), B., 898.  
 containing nitrogen, clean-up of, (P.), B., 944.  
 arc, metallic-vapour, (P.), B., 433.  
 four-electrode, (P.), B., 192.  
 gas-filled, (P.), B., 733, 804.  
 glow, (P.), B., 432.  
 luminescence, positive column, (P.), B., 232.  
 glow, (P.), B., 1039.  
 incandescence, (P.), B., 115.  
 luminescent, (P.), B., 113, 152, 268, 353, 432, 558, 646, 1089.  
 electrodes for, (P.), B., 152, 1089.  
 external coating for, (P.), B., 898.  
 glass for, (P.), B., 944.  
 control of colour of, (P.), B., 733.  
 production of daylight illumination from, (P.), B., 733.  
 direct current, (P.), B., 685.  
 rare-gas, (P.), B., 686.  
 vacuum, (P.), B., 192.  
 cathodes for, (P.), B., 776.  
 thermionic cathodes for, (P.), B., 268.  
 heating apparatus, heat fuse for, (P.), B., 115.  
 devices, (P.), B., 113, 647.  
 ceramic bodies for, B., 105.  
 elements, (P.), B., 944.  
 refractory-embedded, (P.), B., 647.  
 induction coils, mass cores for, (P.), B., 776.  
 insulators. See under Insulators.  
 lamps, external coating for bulbs of, (P.), B., 898.  
 incandescence filament for, (P.), B., 514.  
 with spherical reflectors, (P.), B., 433.  
 obliquely-tipped carbons for, (P.), B., 268.  
 arc, electrodes for, (P.), B., 945.  
 cores for electrodes of, (P.), B., 432.  
 metal-vapour, (P.), B., 733.  
 arc and incandescence, (P.), B., 804.  
 gas-filled, (P.), B., 945.  
 filling for, (P.), B., 28.  
 electrode for, (P.), B., 433.  
 filaments for, (P.), B., 804.  
 containing electric discharge device, (P.), B., 611.  
 glow-discharge, (P.), B., 28.  
 ultra-violet, (P.), B., 776.

Electric lamps, incandescence, (P.), B., 114, 192, 804.  
 conveyor for manufacture of, (P.), B., 192.  
 coated bulbs for, (P.), B., 733.  
 for projectors, (P.), B., 268.  
 lead-in wires for, (P.), B., 992.  
 red, (P.), B., 993.  
 luminescence, rare-gas, (P.), B., 433.  
 nitrogen-filled, arc quenching device for, (P.), B., 558.  
 rare-gas, for illuminating, (P.), B., 268.  
 moments, calculation of, of polar molecules, A., 447.  
 and molecular structure, A., 110, 794, 899, 984.  
 of organic molecules, A., 446.  
 plugs, (P.), B., 993.  
 rectifiers, (P.), B., 352, 513, 558, 685, 732, 898, 1038.  
 unilateral conductors for, (P.), B., 732.  
 cores for, (P.), B., 1038.  
 electrolyte for, (P.), B., 514.  
 use of, in series, (P.), B., 352.  
 aluminium cell, characteristic curves of, A., 231.  
 copper oxide, (P.), B., 514, 1038.  
 manufacture of, (P.), B., 897.  
 electrolytic reduction of surface of, (P.), B., 1038.  
 cuprous oxide, A., 560.  
 micrography of, A., 446.  
 dry, (P.), B., 113.  
 manufacture of, (P.), B., 686.  
 gas-filled, indirectly heated cathodes for, (P.), B., 115.  
 gaseous-discharge, (P.), B., 115.  
 incandescence cathode, (P.), B., 115.  
 mercury-arc, anode shields for, (P.), B., 152.  
 water-cooled, (P.), B., 192.  
 mercury-vapour, (P.), B., 115, 734, 898, 993, 1039.  
 anodes for, (P.), B., 353.  
 de-ionising screen for, (P.), B., 28.  
 evacuation of, (P.), B., 433.  
 incandescence cathode, (P.), B., 514.  
 metal vapour, (P.), B., 192, 898.  
 cooling devices for, (P.), B., 898.  
 resistances, (P.), B., 115.  
 alloys for, B., 986, 1083.  
 production of carborundum elements for, (P.), B., 1089.  
 enamels for, (P.), B., 24.  
 resistors, (P.), B., 993.  
 chromium-nickel alloys for, (P.), B., 112.  
 non-metallic, contact points of, (P.), B., 268.  
 materials for, (P.), B., 69.  
 silicon carbide, operation of, in inert gases, (P.), B., 897.  
 spark, distribution of chemical and thermal effects in, A., 2.  
 microscopic cracks produced by, A., 219.  
 terminals, (P.), B., 115.  
 welding. See under Welding.  
 Electrical apparatus, prevention of electrolytic disintegration of fluids in conduits to, (P.), B., 353.  
 magnetic cores for, (P.), B., 353.  
 fireproof enclosures for, B., 68.  
 insulation-impregnated, drying chambers for, (P.), B., 1089.  
 condensers. See under Condensers.  
 conductivity, measurement of, in pyridine, A., 914.  
 apparatus for, A., 138, 246.  
 of liquids, (P.), B., 734.  
 of binary aggregates, A., 575.

Electrical conductivity of binary systems, A., 340.  
 of pure liquids, A., 899.  
 of metals at low temperatures, A., 983.  
 of solutions of electrolytes, dispersion of, A., 126.  
 of aqueous solutions of metallic salts, A., 214.  
 electrodeless, A., 110.  
 high-frequency, of liquids, A., 899.  
 surface, A., 1206, 1207.  
 See also Superconductivity.  
 dispersion. See under Dispersion.  
 resistance law at low temperatures, A., 219.  
 wire, production of insulating coating on, (P.), B., 353.  
 semi-conductors, electrical and optical properties of, A., 898.  
 transformers. See under Transformers.  
 Electricity, transport of, through phase boundaries, A., 230.  
 relation of, to life, A., 664.  
 Electroaffinity, A., 1191.  
 Electrocapillarity, A., 25, 334.  
 Electrocapillary effect of capillary-active organic compounds, A., 804.  
 Electrochemical industry, economic importance of, B., 558.  
 Electrochemistry, periodicity in, A., 575.  
 quantum mechanics of, A., 699.  
 of organic compounds, A., 1013.  
 technical, B., 432.  
 Electroculture of seeds, B., 75.  
 Electrodes, alternative reactions at, A., 705.  
 kinetics of reactions at, A., 1092.  
 apparatus for study of overvoltage and transfer resistance of, A., 1208.  
 rectifying and valve action of, A., 915.  
 for batteries, accumulators, etc., (P.), B., 352.  
 antimony, A., 999.  
 temperature coefficient of, A., 24.  
 use of, A., 1101.  
 determination of  $p_H$  with, A., 586, 1220.  
 are, for use in therapeutic treatment, (P.), B., 114.  
 are-welding, coating of, (P.), B., 114.  
 bimetallic, with nichrome, for potentiometry, A., 586.  
 carbon, manufacture of, (P.), B., 776.  
 cobalt, potential of, A., 700.  
 corrosion-resistant, (P.), B., 432.  
 gas, kinetics of, A., 24.  
 glass, A., 814, 915.  
 theory of, A., 1207.  
 determination of potential of, A., 24, 342, 1105.  
 relation between potential of, and activity of water, A., 700.  
 use of, in precipitation reactions, A., 709.  
 gold, preparation of, for the spectrograph, A., 828.  
 high tension cored carbon, (P.), B., 232.  
 hydrogen, A., 924.  
 potential of, A., 1092.  
 vessel for, A., 1013.  
 hydrogen effect with, A., 1207.  
 iron as, A., 999.  
 hydrogen-palladium diffusion, A., 230.  
 indifferent, rôle of, in aqueous solutions, A., 471.  
 iron, potential of, A., 342, 813, 999.  
 lead, potential of, A., 342.

- Electrodes**, manganese, determination of  $p_H$  with, A., 1220.  
 mercurous chloride, potential of, A., 700, 1207.  
 mercury, A., 828.  
 polarisation capacity of, A., 24.  
 potassium and sodium, for vacuum arcs, A., 1184.  
 rotating, use of, in electrolysis, A., 243.  
 metallic, use of, as indicators, A., 586.  
 platinum, effect of high current densities on, A., 236.  
 polarisation of, in oxidation and reduction, A., 814, 1092.  
 polarised, influence of high-frequency currents on, A., 915.  
 quartz, A., 471, 575.  
 quinhydrone, A., 699.  
 preparation and reproducibility of, A., 471.  
 reactions at, in methyl alcohol, A., 130.  
 double, A., 241.  
 rigid reference, potentiometric acid-base determinations with, A., 471.  
 selenium and sulphur, Becquerel effect on, A., 1189.  
 silver, in potassium chloride, determination of volume change at, A., 698.  
 silver-lead, chlorine resistant, A., 999.  
 silver chloride, potential of, A., 342.  
 silver-silver chloride, potential of, A., 1207.  
 sodium amalgam, in dilute solutions, A., 470.  
 stick antimony, A., 470.  
 wire, liquid currents and space charge round, A., 981.
- Electrodeposition**, B., 1037.  
 See also Electroplating.
- Electrodialysis**, apparatus for, A., 592; (P.), B., 114.  
 multiple-unit apparatus for, A., 1105.
- Electro-filters**, effect of humidity and temperature on, A., 1077.
- Electro-filtration**, A., 37.
- Electrokinetics**, A., 224, 695, 1208.
- Electrolysers**, diaphragm, theory of, A., 246.
- Electrolysis**, apparatus for, (P.), B., 945.  
 anodes for, (P.), B., 353.  
 stand for, A., 1013.  
 effect of applied voltage on, A., 1208.  
 quantum mechanics of, A., 25.  
 glow-discharge, B., 431.
- Electrolytes**, theory of, A., 1204.  
 regulation of circulation of, in pressure decomposers, (P.), B., 114.  
 adsorption of, by crystals, A., 689.  
 absorption of radiation by, A., 470.  
 effect of non-electrolytes on coagulation of, A., 462.  
 coagulation of colloids by, A., 571.  
 coagulation of colloidal sols by, A., 994, 1087.  
 reactions in concentrated solutions of, A., 703.  
 accumulation of, in living cells, A., 890.  
 colloidal, diffusion of, A., 18.  
 concentrated, reactions in, A., 576.  
 stirred, diffusion current in, A., 812.  
 strong, Debye-Hückel theory of, A., 124.  
 association of, A., 338.  
 viscosity of, A., 1200.  
 weak, calculation of degrees of dissociation of, A., 124.
- Electrolytic apparatus**, (P.), B., 432, 732, 775.  
 curtains for, (P.), B., 733.  
 electrodes for, (P.), B., 192.  
 baths, conveyors for use with, (P.), B., 734.
- Electrolytic condensers**. See under Condensers.
- conductivity, equation for, A., 699.  
 by calorimetry, A., 342.  
 of strong and weak acids, A., 813.  
 of alloys, A., 230.  
 of aqueous salt solutions, A., 230.  
 of univalent electrolytes, A., 699.  
 in ethyl cyanacetate and in *o*-toluonitrile, A., 699.
- crystallisation. See under Crystallisation.
- dissociation, A., 467.  
 potentiometric investigation of, A., 343.  
 of acids in salt solutions, A., 572.  
 double layer, theory of, A., 470.  
 oxidation, A., 1096.  
 pastes, analysis of, by ultrafiltration, B., 191.  
 polarisation. See under Polarisation.  
 reactions, carrying out of, (P.), B., 192.  
 photographic records of, A., 491.  
 with spongy metallic cathodes, (P.), B., 192.  
 rectifiers, A., 915.  
 reduction of organic compounds, A., 1005.  
 resistance, measurement of, A., 592.  
 at high frequency, A., 914.  
 solutions, cathode oscillograph measurements of voltage effect in, A., 231.  
 valves, action of, A., 214, 560, 1077.
- Electro-magnets**, measurement of field strength of, A., 323.
- Electromagnetic discharge**, high-frequency, excitation of atomic jets by, A., 892.
- Electrometers**, capillary, A., 25.  
 Lindemann, A., 37.  
 thermionic, for determination of glass electrode potentials, A., 1105.  
 compensated, A., 1013.
- Electrometer triode** for high resistance measurements, A., 491.
- Electromotive force**. See Potential.
- Electrons**, structure and properties of, A., 672.  
 and atoms, A., 669.  
 mass of, A., 557.  
 mass of protons and, A., 443, 444.  
 radii of, A., 556, 789.  
 high-tension supply for Geiger counters for, A., 317.  
 constants of, A., 1187.  
 emission of, from oxide-coated filaments, A., 208.  
 from a negative probe, A., 789.  
 pliable beams of, A., 1073.  
 effect of clouds of, on de Broglie waves, A., 317.  
 elastic collisions of, A., 105.  
 collisions of, with molecules, A., 317.  
 with magnetic neutrons, A., 1184.  
 with  $\beta$ -particles, A., 791.  
 with rotating dipoles, A., 316.  
 passage of, through matter, A., 980.  
 eigenfunctions for vibration of, A., 441.  
 and light quanta, A., 670.  
 gas concentration of radiation from, A., 106.  
 reflexion of, by crystals, A., 980.  
 diffraction of, and molecular structure, A., 670, 1078.  
 by crystals, A., 3, 670, 893.  
 rectilinear propagation and diffraction of, A., 893.  
 ratio  $h/e$  for, from diffraction, A., 789.  
 specific charge on, A., 672.  
 determination of, from velocity measurements, A., 209.  
 ionisation from impact of, in air, A., 316.
- Electrons**, spin of, A., 5.  
 magnetic moments and moments of rotation of, A., 1184.  
 and electromagnetism, A., 442, 980.  
 isomerism of, A., 441.  
 polarisation of, A., 317.  
 by crystal reflexion, A., 553, 980.  
 by scattering, A., 441, 789.  
 scattering formulae for, A., 789.  
 scattering of, in gases, A., 317, 1185.  
 in helium, A., 980.  
 wandering velocity of, A., 980.  
 wave equations for, A., 441.  
 quantum terms of, in two-centred systems, A., 441.  
 reciprocal action of, A., 980.  
 interaction of, with neutrons, A., 790.  
 interaction of radiation and, A., 209.  
 Dirac's, electric moment of, A., 316.  
 in simple fields, A., 980.  
 and electromagnetic waves, A., 1184.  
 fast, reflection of, by single crystals, A., 1185.  
 free, magnetism of, A., 670.  
 nuclear, A., 3.  
 satellite, A., 1184.  
 slow, photographic action of, A., 821.  
 collision of, with atoms, A., 670.  
 in gases, A., 670.  
 scattering of, A., 554.  
 by neutral atoms, A., 553.  
 by gases, A., 442.  
 spinning, A., 209.  
 surface, A., 553.  
 vibrating, collisional friction of, in ionised air, A., 670.
- Electron-discharge**, alloy for, B., 645.  
 cathodes for, (P.), B., 558.  
 materials for, (P.), B., 433.  
 devices, (P.), B., 114, 944, 992, 1038.  
 cathodes for, (P.), B., 114, 191, 733.  
 thermionic cathodes for, (P.), B., 944.  
 electrodes for, (P.), B., 897.  
 filaments for, (P.), B., 944.  
 insulator support for, (P.), B., 984.  
 incandescence, cathodes for, (P.), B., 1038.  
 tubes, A., 925; (P.), B., 192, 432.  
 cathodes for, (P.), B., 352, 514.  
 with incandescence cathodes, (P.), B., 353.  
 grids for, (P.), B., 558.  
 clean-up of, (P.), B., 114.
- Electron metal**, B., 429.
- Electron microscope**, A., 1184.
- Electro-osmosis**, measurements in, A., 1208.  
 technical applications of, B., 943.  
 through palmitic acid diaphragms, A., 17.
- Electrophoresis** and the Debye-Hückel theory, A., 911.  
 technical applications of, B., 943.  
 in biological media, A., 550.  
 microscopic, A., 695.
- Electrophotometer**, A., 713.
- Electrophotophoresis**, A., 21.  
 effect of light intensity and gas pressure on, A., 21.
- Electroplating**, (P.), B., 191, 685.  
 apparatus for, (P.), B., 898, 1037.  
 automatic apparatus for, (P.), B., 513.  
 addition agents for baths for, (P.), B., 473.  
 throwing power of solutions for, B., 645, 845.  
 of articles in bulk, (P.), B., 354.  
 of endless surfaces, (P.), B., 557.
- Electroscope**, direct-reading, for  $\gamma$ -rays, A., 828.
- Element No. 85**, A., 353, 1073.  
 No. 87, A., 210, 317.

- Element No. 87, spectrum of, A., 1183.  
detection of, magneto-optically, A., 355.
- No. 91, A., 670.
- Elements, conception of, A., 1074.  
distribution of, in nature, and atomic volume, A., 554.  
classifications of, A., 4, 1186.  
based on atomic structure, A., 894.  
crystal parameters of, A., 557.  
relation of energy levels of, to valency, A., 669.  
disintegration of, by high-velocity protons, A., 893.  
with consecutive atomic numbers, directive powers of, A., 949.  
of the eighth group, specific heats of, A., 13.  
of the oxygen group, salt-forming characteristics of, A., 612.  
light, nuclear moments of, A., 1071.  
radioactive. See Radioactive elements.
- Elemic acid, and its reduction, A., 397.
- $\delta$ -Elemic acid, and its methyl ester, A., 750.
- $\alpha$ -Elemolic acid, A., 1253.
- Elemonic acid, A., 397.
- $\alpha$ -Elemonic acid, and its oxime, A., 750, 1253.
- Elinvar, B., 891.
- Elodea*, intake of sugar by, A., 437.
- Elodea canadensis*, effect of electric current on chlorophyll assimilation in, A., 1295.  
influence of sulphurous acid on, A., 786.
- Elsholtzia ketone. See 3-Methyl-2-furyl isobutyl ketone.
- Eltsholtzic acid. See 3-Methylfuroic acid.
- Embryology by the injection method, A., 298.
- Emodin, detection of, in medicines, B., 287.
- Emphysema, pulmonary, alveolar carbon dioxide in, A., 417.
- Empoasca fabae*, control of, on young apple trees, B., 813.
- Emulsification, A., 1086.  
of water-insoluble substances, (P.), B., 233.
- Emulsification apparatus, (P.), B., 133.
- Emulsifying agents, (P.), B., 736, 1040.  
manufacture of, (P.), B., 221, 252, 332, 415, 495, 671, 764, 792, 832, 928, 1020, 1072, 1114.  
deaminised gelatins as, B., 439.
- Emulsin, A., 543, 776, 1063.  
action of, A., 1165.  
almond, influence of long maceration on, A., 776.
- Emulsions, A., 335, 994, 1086.  
cryolysis in formation of, A., 909.  
preparation of, B., 163, 164.  
clay suspensions for, B., 648.  
production of, (P.), B., 406, 928, 1114.  
apparatus for, (P.), B., 453, 485, 533.  
machines for, (P.), B., 405.  
from milk and oil, etc., (P.), B., 995.  
determination of type of, A., 692.  
treatment of, (P.), B., 292.  
dielectric constant of, A., 462.  
viscosity of, A., 1195.  
surface tension of, A., 336.  
stability of, A., 333.  
dehydration of, (P.), B., 762.  
alkaline water-oil, breaking of, B., 969.  
aqueous, preparation of, (P.), B., 292.  
asphalt, testing of, B., 665.  
bituminous, (P.), B., 136.  
manufacture of, (P.), B., 1067.  
Myers' demulsification test for, B., 246.  
bituminous-aqueous, manufacture of, (P.), B., 668.  
gas-liquid, preparation of, (P.), B., 164.
- Emulsions, mercury, A., 1086.  
mineral oil-water, treatment of, (P.), B., 925.  
oil, electric charge on drops in, A., 910.  
oil-water, production of, (P.), B., 152.  
oil-water, resolution of, (P.), B., 93, 669, 713.  
electrical properties of, A., 910.  
petroleum, breaking of, (P.), B., 412, 413, 669.  
electrical dehydrators for, (P.), B., 192.  
petroleum oil-water, breaking of, (P.), B., 877.  
rubber. See Rubber emulsions.  
tar, manufacture of, (P.), B., 171.
- Enamels, production of, (P.), B., 779.  
natural-gas firing in, B., 104.  
apparatus for grinding of, (P.), B., 453.  
grinding mill for, (P.), B., 197.  
testing of physical properties of, B., 887.  
Gardner mobilometer for measurement of consistency of, B., 888.  
resistance to crazing of, B., 342.  
relative viscosity of, B., 725.  
crystalline compounds causing opacity in, B., 228.  
olovine as medium for, B., 806.  
causes of floating pigments in, B., 195.  
relative merits of varnishes and, B., 562.  
mechanics of adherence of, B., 23.  
adherence of, to iron plate, B., 1031.  
to metals, B., 1030.  
for metals, (P.), B., 771.  
for cast-iron and sheet metals, (P.), B., 64.  
for iron, (P.), B., 68.  
for iron or steel, (P.), B., 1032.  
for sheet iron, B., 1031; (P.), B., 983.  
for sheet-steel, cross-bending strength of, B., 306.  
acid-resisting, for cast-iron, B., 306.  
cellulose, non-graining, (P.), B., 518.  
dental. See under Dental.  
electrical insulating, production of, (P.), B., 24.  
ground-coat, adherence of, B., 23.  
containing lead, manufacture of, (P.), B., 983.  
low-temperature, production of, on a fluoride eutectic basis, B., 342.  
nitrocellulose, pigment pastes for, B., 1126.  
oil, red- or white-lead priming for, B., 778.  
porcelain, effect of fineness of felspar in, on resistance to deflection, B., 306.  
pyroxylin, (P.), B., 1091.  
vitreous, removal of, from metallic articles, (P.), B., 311.  
white, production of, (P.), B., 343.  
opaque, frits for production of, (P.), B., 983.  
microscopy of coatings of, B., 1031.  
preparation of sections of, on metals for microscopic analysis, B., 23.
- Enargite, antimony-rich, from Hungary, A., 715.
- Endecamethyltrioste, molecular size of, A., 725.
- Endocrine disease, anterior pituitary hormone in urine in, A., 1157.
- Endocrine extracts, effect of, on carbohydrate metabolism, A., 546.
- Endotoxin, bacterial, A., 1291.
- 3:6-Endoxomethyl-4<sup>t</sup>-tetrahydrophthalic anhydrides, A., 166.
- Energy, transformations of, at surfaces, A., 7, 446.  
adsorption, and light absorption, A., 909.
- Energy, electronic, of elements, A., 216.  
radiant, measurement of, with thermopiles, A., 924.
- Engines, electrodeposition of metals on cylinder linings for, (P.), B., 189.  
combustion and knocking in, B., 920.  
comparison of spontaneous ignition temperatures and starting and ignition delay tests in, B., 920.  
automobile, lubrication of, with olive oil, B., 163.  
coal dust, ignition and combustion in, B., 824.  
compression-ignition, ignition of fuels in, B., 327.  
Diesel, evaluation of fuels for, B., 1065.  
ignition quality of fuels for, B., 920.  
manufacture of oils for, (P.), B., 1069.  
oils from Fischer-Tropsch benzene synthesis as fuels for, B., 920.  
use of heavy oils in, B., 169.  
explosion, formation of nitro-hydrocarbons in, B., 824.  
heavy-oil, high-speed, injection, ignition and combustion in, B., 7.  
internal combustion, removal of carbon deposits from, (P.), B., 490, 586, 827.  
removal of combustible constituents from combustion products of, (P.), B., 11\*.  
catalytic combustion in, (P.), B., 400.  
spectroscopic studies of combustion in, B., 585.  
products of combustion in, (P.), B., 926.  
pinking in, B., 870.  
flame radiation and temperatures in, B., 871.  
aluminum alloy for pistons for, (P.), B., 684.  
fuels for, (P.), B., 11, 220, 378, 827, 1019.  
relation between fuels and design of, B., 169.  
ozonised fuels for, (P.), B., 926.  
ozoniser for intake of, (P.), B., 1067.  
volatilisation of fuels in, (P.), B., 715.  
metals for valves for, B., 1036.  
treatment of lubricating oils in, (P.), B., 250.  
paraffin-base lubricating oils for, B., 169.  
electrolytic generation of oxygen-hydrogen mixtures for, (P.), B., 993.  
anti-freezing mixture for cooling water for, (P.), B., 1087.
- Engineering, chemical, materials used in, B., 1107.  
use of acid- and rust-resistant steels in, B., 27.  
alloy steels for use in, B., 774.  
applications of photo-electric cells in, B., 558.
- Enterokinase, formation of, in the pancreas, A., 1287.  
from pancreatic extracts, A., 881.
- Enteromorpha compressa*, gas in, A., 1177.
- Entropy, calculation of constant of, A., 454.  
and the Pauly principle, A., 799.  
effect of reversible processes and thermocouples on, A., 454.  
of polyatomic molecules, A., 14.
- Enzymes, A., 880.  
and their action, A., 966.  
production of, from fish, (P.), B., 958.  
secretion of, A., 1286.  
histochemistry of, A., 304, 427.  
effect of light on, A., 90.  
action of rays on, A., 777.  
preparation of activating solutions of, A., 74.

**Enzymes**, preservation of solutions of, (P.), B., 700.  
 cryolysis in processes with, A., 909.  
 chain reactions in catalysis by, A., 917.  
 similarity of organic catalysts and, A., 236.  
 chemistry of, A., 90.  
 reactions of, and structure, A., 881.  
 inhibition of, by carcinogenic compounds, A., 1156.  
 action of dyes on, A., 1287.  
 action of morphine on, A., 1167.  
 effect of salt ions on, A., 665.  
 amyolysis by, A., 193.  
 combination of, with substrates, A., 648.  
 fission of optically-active compounds by, A., 1166.  
 measurement of hydrolysis by, with dilatometer, A., 649.  
 synthesis by, A., 648.  
 activation of, by serum, A., 641.  
 as a protection against disease, B., 622.  
 amyolytic, A., 304.  
   action of bases on activity of, A., 304.  
   defence, specificity of, A., 765.  
   dehydrogenating, A., 650.  
   diastatic, of flour, sugar formation by, B., 573.  
     in foods, B., 574.  
     of malt and flour, development of, B., 572.  
 intracellular, of glands and tissues, A., 881.  
 new oxidation, A., 1285.  
 oxidising, classification of, A., 649.  
   in gum arabic, B., 397.  
   in vegetable tanning materials, B., 1001.  
 oxygen-carrying, A., 1164.  
 pancreatic, A., 303.  
 in plants, action of alkaloids and carbon monoxide on activity of, A., 649.  
 polysaccharide-splitting, specificity of, A., 1062.  
 proteolytic, constitution of, A., 304.  
   extraction of, from fig, mulberry, papaya, pineapple or banana trees, (P.), B., 1004.  
   measurement of activity of, (P.), B., 444.  
   of intestine and pancreas, A., 649.  
   influence of phosphatides on, A., 777.  
 respiratory, A., 426.  
 determination of, in pharmaceutical preparations, B., 623.

**Enzymes**. See also:—  
 Adenosinetriphosphatase.  
 Adenylpyrophosphatase.  
 Aldehydease.  
 Allantoinase.  
 Aminopolypeptidase.  
 Amylase.  
 Antiglyoxalase.  
 Aspartase.  
 Baicalinase.  
 Carboligase.  
 Carboxylase.  
 Carboxypolypeptidase.  
 Carotenase.  
 Catalase.  
 Cocarboxylase.  
 Cozymase.  
 Dehydrodipeptidase.  
 Diastase.  
 Dopa-oxidase.  
 Emulsin.  
 Fumarase.  
 Glucophosphatase.  
 Glycerophosphatase.  
 Glycolase.  
 Histaminase.  
 Hydrogenylase.

**Enzymes**. See also:—  
 Invertase.  
 Lactase.  
 Lipase.  
 Nucleophosphatase.  
 Nucleotidase.  
 Pepsin.  
 Peptidase.  
 Peroxidase.  
 Phosphatase.  
 Phosphocsterase.  
 Phytase.  
 Proteinase.  
 Ptyalin.  
 Pyrophosphatase.  
 Succinohydrogenase.  
 Takapyrophosphatase.  
 Trypsin.  
 Tyrosinase.  
 Urease.  
 Uricase.  
 Uric-oxylase.

**Enzyme action**, A., 304, 775, 880.  
 dilatometric studies of, A., 880, 1286.  
 mechanism of, A., 352.  
 reactions resembling, A., 966.  
 in relation to cryolysis of colloids, A., 337.  
 relation of copper and iron to, A., 430.  
 Eosin B, commercial, impurity of, A., 1258.  
 Eosin, iodo-, as indicator, A., 586.  
 Ephedrine, configuration of, A., 267.  
   action of, on benzaldehyde, A., 757.  
   halogen analogues of, A., 1245.  
   effect of, on blood-lactic acid, A., 1163.  
 l-Ephedrine, manufacture of, (P.), B., 241.  
 Ephedrine bases, configuration of, A., 627.  
 Ephedras, Indian, B., 207.  
   determination of alkaloids in, B., 206.  
 Ephetone, action of, on respiration, A., 540.  
 Epibromohydrin, preparation of, A., 497.  
 Epichlorohydrin, preparation of, A., 497.  
 Epididymis, bromine content of, A., 958.  
 Etiethylin. See Glycidyl ethyl ether.  
 Epilepsy, blood- and cerebrospinal fluid-calcium in, A., 873.  
   glucose tolerance curve in, A., 1057.  
   sodium chloride and water balance in, A., 873.  
   in children, water and mineral balances in, A., 1157.  
   idiopathic, urinary proteose in, A., 1278.  
 Epinatrolite, in hydronphelinite, A., 1229.  
 Epinine, synthesis of, A., 843.  
 Epiphenylin. See Phenyl glycidyl ether.  
 Epsomite, crystal structure of, A., 903, 987.  
   orientation of, on mica, A., 451.

**Equation of energy and entropy of gases**, A., 116.  
 Arrhenius, relation between constants of, A., 1093.  
 chemical, working out coefficients in, A., 828.  
 Debye-Hückel, value of  $a$  in, A., 696.  
 Dirac's, A., 441.

**Equation of state**, theory of, A., 328.  
 for gases of low densities, A., 906.  
 for non-ideal gases, A., 906.  
 of real gases, quantum correction for, A., 328.  
 of gases and liquids, A., 14.  
 van der Waals', A., 906.  
   constant of, A., 685.  
   calculation of volume correction in, A., 902.  
   for inert gases, A., 220.

**Equilibrium**, diagrams of, A., 339.  
 solving equations for, with duplex slide rule, A., 913.

**Equilibrium**, shifting of, by catalysts, A., 818.  
 of gases, charts for, A., 808.  
 at membranes, A., 17, 334.  
 between two phases, A., 459.  
 in systems, A., 812.  
 in binary systems under pressure, A., 810.  
 in liquid systems, A., 1197.  
 in non-metallic systems, A., 997.  
 thermal dissociation, of inorganic compounds, A., 124.

**Equiline**, structure of, A., 1079.  
 and its derivatives, A., 433, 547.

**Equol**, and its derivatives, A., 1156.

**Ergine**, and its salts, A., 526.

**Ergochrysin**, and its derivatives, A., 1137.

**Ergoflavio acid**, A., 1137.

**Ergoflavin**, and its penta-acetyl derivative A., 1137.

**Ergostadienes**, A., 845.

**Ergostadienone III**, and its oxime, A., 381.

**allo- $\alpha$ -Ergostanol**, A., 511, 845.

**Ergostanone**, bromo-, A., 1127.

**Ergostatriene-D**, A., 845.

**Ergostatrienols B**, and their acetates, A., 381.

**Ergostatrienones B**, and their oximes, A., 381.

**$\alpha$ -Ergostendione**, A., 845.

**Ergostenes**, and their oxides, A., 845.

**$\beta$ -Ergostenol**, and its acetate, A., 511.

**Ergostenols**, and their salts and derivatives, A., 845.

**$\alpha$ -Ergostenol**, and its derivatives, A., 845.

**Ergosterol**, molecular formula of, and its oxidation, A., 1127.  
 production of, (P.), B., 996.  
 photochemistry of, A., 480.  
 separation of irradiation products of, A., 98.  
 and its derivatives, crystal structure of, A., 327.  
 isomerisation of, A., 54.  
 isomerides of, and its hydrogenation, A., 511.  
 activation of, A., 1070.  
 antirachitic activation of, A., 783.  
 relation between carotene and, A., 737.  
 and its derivatives, action of ozone on, A., 267.  
 and its derivatives, ethers of, A., 267, 845.  
 derivatives, isomerisation of, A., 381.  
   action of oxidising agents on, A., 611.  
 in edible mushrooms, A., 437.  
 from *Penicillium puberulum*, A., 195.  
 content of, in yeast, A., 93.  
 resorption of, A., 772.  
   in hens, A., 1282.  
 synthesis of, in hen's eggs, A., 189.  
 effect of hormones on toxicity of, A., 658.  
 activated, effect of, in tuberculosis, A., 873.  
 from ergot, determination of  $\alpha$ -dihydro-ergosterol in, A., 511.  
 irradiated, autoxidation of, A., 783.  
   feeding of cows on, A., 1176.  
   toxicity of, A., 311, 537, 1070.  
   action of, A., 658.  
     on blood-calcium, A., 1070, 1176.  
     on bones, A., 312.  
     on calcium, nitrogen, and phosphorus metabolism, A., 98.  
   in the organism, A., 1176.  
   in relation to parathyroid function, A., 434.  
   on inorganic serum phosphate, A., 98.  
   compared with that of vitamin-D in cod-liver oil, A., 974.



- Ergosterol, irradiated, excess calcium in hypercalcaemia from, A., 98.  
antirachitic vitamin from, A., 201.  
of antirachitic value, (P.), B., 624.  
See also Viosterol.  
determination of, A., 1282.  
polarimetrically, with cholesterol and zymosterol, A., 955.
- Ergosterol-G, and its acetate, A., 268.  
neoErgosterol, and its salts, A., 944.
- Ergot, stability of fluid extracts of, B., 206.  
standardisation and stabilisation of preparations of, B., 576, 656.  
non-alkaloidal fraction of, A., 662.  
sterols of, A., 511.  
yellow dyes of, A., 1137.  
physiological activity of extracts of, as determined by cock's comb and colorimetric methods, B., 241.  
evaluation of, B., 576.  
chemical evaluation of, B., 79.  
colorimetric assay of, B., 1135.  
spectrographic analysis of, B., 447.
- Ergot alkaloids, A., 526, 629, 759, 1147.
- Ergot oil, thermal decomposition of, B., 686.
- Ergotamine, structure of, A., 759.  
effect of, on hyperglycaemia during phosphorus poisoning of liver, A., 424.
- Ergothioneine from blood, A., 869.  
determination of, in blood filtrates, A., 634.
- Ergotinine, degradation of, A., 526.  
oxidation of, A., 1147.
- Ergotoxine, structure of, A., 759.  
degradation of, A., 526.
- Eriobotrya japonica*. See Medlars, Japanese.
- Erucic acid, acid potassium salt, A., 1018.  
determination of, by Hübl's method, A., 144.
- Erucic acid, *p*-bromo-, *p*-chloro-, and *p*-phenyl-phenacyl esters, A., 946.
- "Erycon." See 2-Anisylquinoline-4-carboxylic acid.
- Eryngium fatidum*, ethereal oil from, A., 721.
- Erythrina variegata*, seeds of, A., 1179.
- Erythritol, equilibrium in binary systems containing, A., 928.  
*meso*Erythritol triphenyl methyl ether, A., 42.
- Erythrocytes. See Blood-corpuscles, red.
- dl*-Erythro- $\alpha$ -*di*hydroxybutyric acid, A., 499.
- Erythroxylon novogranatense*, lycopene in fruit of, A., 1178.
- Escherichia coli*, resistance of, to cations, A., 654.  
oxygen consumption of, A., 969.
- dl*-Eserethole, A., 288.
- Eserine (*physostigmine*), synthesis of, A., 759.  
pharmacology of analogues of, A., 88.  
detection of, colorimetrically, A., 868.
- Esermethole, and its salts, A., 289.
- dl*-Esermethole methopicate, synthesis of, A., 759.
- Eskimos, metabolism of, A., 83.
- Esparto grass, manufacture of products from non-cellulosic constituents of, B., 594.
- Esters, use of boron fluoride in catalytic preparation of, A., 728.  
manufacture of, (P.), B., 494, 670, 671, 1114.  
catalytically, (P.), B., 1114.  
from olefines, (P.), B., 332.  
dipole moments of, A., 8.  
addition of alkali alkoxides to, A., 599, 614, 831.
- Esters, alcoholysis of, by mixed magnesium alkoxides and phenoxides, A., 1018.  
decomposition of, in alkaline alcohol, A., 578.  
catalytically, by aluminium oxide, A., 43.  
by nickel, A., 478.  
catalytic hydrogenation of, to alcohols, A., 599.  
alkaline hydrolysis of, A., 1209.  
catalysis of hydrolysis of, by acids, A., 1004.  
condensation of, with benzene, in presence of aluminium and thallium trichlorides, A., 1240.  
reaction of, with alcohols, in alkaline solution, A., 42.  
enzymic formation and hydrolysis of, A., 776, 967.  
enzymic production of, A., 92.  
carboxylic, hydrolysis of, A., 498.  
cyclic, six-membered, reversible polymerisation of, A., 366.  
of dibasic acids, saponification of, A., 127.  
with hydrocarbon radicals, dipole moments of, A., 9.  
mixed, rubber-like, production of, from polyhydric alcohols, (P.), B., 671.  
unsaturated, tautomerism of, A., 1111.  
determination of, in alcoholic liquors, B., 159.
- Esterase, asymmetric hydrolysis by, of racemic mandelic esters, A., 967.  
inhibition by urethanes of action of, A., 1166.  
blood, A., 1273.  
liver, inhibiting action of saturated aliphatic alcohols on, A., 193.  
inhibitory action of organic compounds on, A., 543.
- Esterification, B., 1070.  
effect of salts on, A., 818.  
with mixed anhydrides and mixtures of anhydrides, A., 365.  
in glycerol and ethyl alcohol, A., 1210.  
in presence of silica gel, A., 129.
- Ethane, pure, preparation of, and its determination in a mixture of hydrocarbons, A., 495.  
action of ultra-violet light on, A., 1215.  
heat of adsorption of, on decomposed potassium permanganate, A., 459.  
influence of hydrogen on pyrolysis of, A., 701.  
derivatives, stereochemistry of, A., 609.  
*di*- and *tetra*-substituted, freezing of mixtures of, A., 124.  
determination of, in mixtures with methane, propane, and hydrogen, A., 241.
- Ethane, *aaa*-tribromo-, oxygenated derivatives of, (P.), B., 493.  
*aa* $\beta$ -tribromo-*a* $\beta$ -dinitro-, A., 718.  
*tetrachloro*-, action of ultra-violet light on, A., 830.  
determination of water by distillation with, A., 486.  
*hexachloro*-, manufacture of, (P.), B., 1071.  
fluorination of, under pressure, and *aa* $\beta$  $\beta$ -*pentachloro*- $\beta$ -fluoro-, *aa* $\beta$  $\beta$ -*tetrachloro*-*a* $\beta$ -difluoro-, and *aa* $\beta$ -*trichloro*-*a* $\beta$  $\beta$ -trifluoro-, A., 496.  
chlorobromo-, dielectric constant of, A., 677.
- Ethanesulphonamide, A., 1018.
- Ethanesulphonie acid, chloro-, and its salts and chloride, manufacture of, (P.), B., 251.
- Ethanesulphonyl fluoride, and  $\alpha$ -chloro-, A., 365.
- Ether. See Ethyl ether.
- Ether, constitution of the, A., 926.
- Ethers, manufacture of, from alkyl hydrogen sulphates, (P.), B., 332.  
pressure-temperature curves for, A., 1195.  
reaction of, with acetyl and chloroacetyl iodides, A., 1017.  
action of selenium oxychloride on, A., 70.  
substances related to, A., 833, 1232.  
aliphatic, mixed, preparation of, A., 718.  
cyclic, manufacture of, (P.), B., 832.  
mixed, preparation of, A., 831.  
phenolic, halogenation of, A., 26.
- Ether-lactones, synthesis of, from diethereal acids, A., 833.
- Ethionic acid, and its homologues and analogues, manufacture of, (P.), B., 1072.
- Ethoxalyl bromide, A., 1233.
- Ethoxide, aluminium, preparation of, as catalyst, A., 579.
- Ethoxyacetic acid, esters of, A., 1019.
- Ethoxyacetolactone, synthesis of, A., 833.
- p*-Ethoxyacetophenone,  $\omega$ -amino-, hydrochloride, A., 391.
- $\beta$ -Ethoxy- $\gamma$ -isoamyl-octan- $\gamma$ -ol, A., 41.
- 4-Ethoxybenzaldehyde, 3-fluoro-, A., 1247.
- o*-Ethoxybenzhydramine, and its salts, A., 52.
- o*-Ethoxybenzophenone, and its derivatives, A., 52.
- 6-Ethoxybenzthiazole, 2-amino-, pharmacology of, A., 301.
- $\alpha$ -Ethoxybenzyl chloride, A., 1132.
- $\alpha$ -Ethoxy- $\beta\beta\beta$ -tribromoethylcarbamide, and its *N*'-acetyl derivative, A., 1114.
- s*-( $\alpha$ -Ethoxy- $\beta\beta\beta$ -tribromoethyl) ( $\alpha$ -ethoxy- $\beta\beta\beta$ -trichloroethyl)carbamide, A., 1114.
- s*-( $\alpha$ -Ethoxy- $\beta\beta\beta$ -tribromoethyl)-( $\alpha$ -hydroxy- $\beta\beta\beta$ -trichloroethyl)carbamide, A., 1114.
- s*-( $\alpha$ -Ethoxy- $\beta\beta\beta$ -tribromoethyl) ( $\alpha$ -methoxy- $\beta\beta\beta$ -trichloroethyl)carbamide, A., 1114.
- $\beta$ -Ethoxy- $\Delta^a$ -butene- $\alpha\delta$ -dicarboxylic acid, and its ethyl ester, A., 1247.
- $\gamma$ -Ethoxy- $\Delta^a$ -butene,  $\alpha$ -bromo-, A., 928.
- $\alpha$ -Ethoxy-*n*-butyl chloride, A., 1132.
- $\beta$ -Ethoxy- $\gamma$ -butylheptan- $\gamma$ -ol, and its phenylurethane, A., 41.
- $\gamma$ -Ethoxy- $\delta$ -butyloctan- $\delta$ -ol, and its phenylurethane, A., 41.
- $\gamma$ -Ethoxy- $\delta$ -butyl- $\Delta^a$ -octene, A., 143.
- Ethoxycamphoranilic acid, and 4'-nitro-, A., 1253.
- Ethoxy-1:1-diethyl-2:2'-carboquinocyanine 1-iodide, A., 756.
- 5-Ethoxy-7:8-dimethoxyflavone, A., 64.
- $\beta$ -Ethoxy- $\beta$ - $\gamma$ -dimethylbutane,  $\alpha$ -bromo-, A., 361.
- 5-Ethoxy-1:3-dimethyl-3-ethyl-2-indolinium picate, A., 1142.
- 5-Ethoxy-3:3-dimethylindolenine, and its salts, A., 287.
- 5-Ethoxy-3:3-dimethylindolemine-2-carboxylic acid, A., 287.
- 4'-Ethoxydiphenyl, 4-fluoro-2:3'-dinitro-, A., 374.
- 4'-Ethoxydiphenylamine, 2:4:6-trinitro-, A., 1124.
- $\beta$ -Ethoxy-*aa*-diphenylbutan- $\alpha$ -ol, A., 41.
- $\alpha$ -Ethoxy- $\alpha\beta$ -diphenylloxan, A., 63.
- $\beta$ -Ethoxy-*aa*-diphenylpropan- $\alpha$ -ol, and its phenylurethane, A., 41.
- Ethoxyergostatriene, A., 267.
- $\gamma$ -( $\beta$ -Ethoxyethoxy)butyric acid, A., 950.

- $\gamma$ -( $\beta$ -Ethoxyethoxy)propane- $\alpha\alpha$ -dicarboxylic acid, and its derivatives, A., 950.  
 Ethoxyethyl arsenite, A., 937.  
 $\beta$ -Ethoxy- $\beta$ -ethylbutane,  $\alpha$ -bromo-, A., 361.  
 $\alpha$ -Ethoxyethylcarbamide,  $\beta\beta\beta$ -trichloro-, and its  $N$ -acetyl derivative, A., 151.  
 $N$ -( $\alpha$ -Ethoxyethyl)- $N'$ -( $\beta\beta\beta$ -trichloro- $\alpha$ -hydroxyethyl)carbamide,  $\beta\beta\beta$ -trichloro-, and its  $N'$ - $\alpha$ -acetoxy-derivative, A., 151.  
 $N$ -( $\alpha$ -Ethoxyethyl)- $N'$ -( $\beta\beta\beta$ -trichloro- $\alpha$ -methoxyethyl)carbamide,  $\beta\beta\beta$ -trichloro-, A., 151.  
 $N$ -( $\alpha$ -Ethoxyethyl)- $N'$ -( $\beta\beta\beta$ -trichloro- $\alpha$ -propoxyethyl)carbamide,  $\beta\beta\beta$ -trichloro-, A., 151.  
 $\delta$ -Ethoxy- $\gamma$ -ethylhexan- $\gamma$ -ol, A., 41.  
 $\delta$ -Ethoxy- $\gamma$ -ethylpentan- $\gamma$ -ol, and its phenylurethane, A., 41.  
 $\gamma$ -Ethoxyhexane,  $\beta$ -bromo-, A., 361.  
 $\beta$ -Ethoxy- $n$ -hexenonitrile, A., 372.  
 $\beta$ -Ethoxyhexoic acid, ethyl ester, A., 1111.  
 $\beta$ -Ethoxyindolinones, A., 1142.  
 Ethoxyl groups, determination of, A., 867.  
 $\gamma$ -Ethoxymethylbenzaldehyde, synthesis of, and its derivatives, A., 161.  
 $\beta$ -Ethoxy- $\gamma$ -methylbutanes, A., 1109.  
 $\beta$ -Ethoxy- $\gamma$ -methylbutan- $\gamma$ -ol, A., 1109.  
 $\gamma$ -Ethoxy- $\beta$ -methylbutan- $\beta$ -ol, and its phenylurethane, A., 41.  
 $d$ - $\beta$ -Ethoxy- $\gamma$ -methyl- $\Delta\gamma$ -butene, A., 1109.  
 $\gamma$ -Ethoxy- $\beta$ -methyl- $\delta$ -butyloctan- $\delta$ -ol, A., 831.  
 $\beta$ -Ethoxy-3-methyl-3-( $\beta$ - $\alpha$ -carboxybenz-amidoethyl)indolenine-2-carboxylic acid, and its derivatives, A., 287.  
 Ethoxymethyldihydroeostychnine, A., 527.  
 Ethoxy-5-methyldiphenylamines, 2:4-dinitro-, A., 1124.  
 $\gamma$ -Ethoxy- $\beta$ -methyl- $\delta\delta$ -diphenylbutan- $\delta$ -ol, A., 831.  
 $\gamma$ -Ethoxy- $\beta$ -methyl- $\delta$ -ethylhexan- $\delta$ -ol, A., 831.  
 $\beta$ -Ethoxy-3-methyl-3-ethyl-2-indolinone, A., 1142.  
 Ethoxymethylpentanes, bromo-, A., 361.  
 $9$ - $\alpha$ -Ethoxymethylphenylxanthohydrol, A., 613.  
 $\beta$ -Ethoxy-3-methyl-3-( $\beta$ -phthalimidoethyl)-indolenine, and its salts, A., 287.  
 $\beta$ -Ethoxy-3-methyl-3-( $\beta$ -phthalimidoethyl)-indolenine-2-carboxylic acid, derivatives of, A., 287.  
 $\beta$ -Ethoxy-3-methyl-3-( $\beta$ -phthalimidoethyl)-indolinone, A., 287.  
 $\beta$ -Ethoxy-3-methylcyclopropane-1:2-dicarboxylic acid, derivatives of, A., 1247.  
 $\gamma$ -Ethoxy- $\beta$ -methyl- $\delta$ -propylheptan- $\delta$ -ol, A., 831.  
 $\beta$ -Ethoxy-1-methyl-3-isopropyl-2-indolinone, A., 1142.  
 $\delta$ -Ethoxy-2-methylquinoline, 4-chloro-, and 4-hydroxy-, and their salts, A., 951.  
 $\beta$ -Ethoxymethyltriphenylcarbinol, A., 613.  
 $\alpha$ -Ethoxypalmitic acid, A., 366.  
 Ethoxyphenols,  $\beta$ -hydroxy-, A., 510.  
 $4$ -(4'-Ethoxyphenoxy)aniline, 3:5-diiodo-, hydrochloride, A., 611.  
 $4$ -(4'-Ethoxyphenoxy)nitrobenzene, 3:5-diiodo-, A., 611.  
 $\beta$ -Ethoxyphenyl methyl and ethyl sulphides, A., 1244.  
 $N$ - $\alpha$ -Ethoxyphenyl-3-acetyl-5-phenyl-2-methylpyrrole, A., 1263.  
 $\beta$ -Ethoxyphenylbarbituric acid, and its derivatives, A., 951.  
 Ethoxyphenyl benzyl ketones, and their derivatives, A., 391.  
 $\alpha$ -Ethoxy- $\alpha$ -phenyl- $\beta$ -butylhexan- $\beta$ -ol, and its phenylurethane, A., 41.  
 $\alpha$ -Ethoxy- $\alpha$ -phenyl- $\beta$ -butyl- $\Delta$ -hexene, A., 143.  
 $3'$ -Ethoxy- $N$ -phenylcamphorimide, A., 1253.  
 $\alpha$ -Ethoxy- $\alpha$ -phenyl- $\beta$ -ethylbutan- $\beta$ -ol, and its phenylurethane, A., 41.  
 $1$ -Ethoxy-2-phenyl-1- $\gamma$ -methoxyphenylethylene, 2-nitro-, A., 730.  
 $\gamma$ -Ethoxyphenylmethylhydrazine, derivatives of, A., 1142.  
 $\gamma$ -Ethoxyphenyl methylsulphone, A., 1244.  
 $3$ -Ethoxy-5-phenyl-1:2:4-oxadiazole, A., 757.  
 $\alpha$ -Ethoxy- $\alpha$ -phenyl- $\beta$ -propylpentan- $\beta$ -ol, and its phenylurethane, A., 41.  
 $\gamma$ -Ethoxyphenylthiocarbamide, inability to taste, A., 774.  
 Ethoxyphenylthiourethanes, A., 154.  
 $\alpha$ -Ethoxypropan- $\beta$ -ol,  $\gamma$ -nitro-, A., 497.  
 $\alpha$ -Ethoxypropionic acid, identification of, and its anilide, A., 1019.  
 $\gamma$ -Ethoxy-6-propylheptan- $\delta$ -ol, and its phenylurethane, A., 41.  
 $\gamma$ -Ethoxy-6-propyl- $\Delta\gamma$ -heptene, and its ethylene oxide, A., 143.  
 $\beta$ -Ethoxy- $\gamma$ -propylhexan- $\gamma$ -ol, A., 41.  
 $\beta$ -Ethoxy-3-propyl-2-indolinones, A., 1142.  
 $4$ -Ethoxypyridine-2:6-dicarboxylic acid, 3:5-diiodo-, and its methyl ester, A., 622.  
 $6$ -Ethoxyquinoline, 8- $\alpha$ -hydroxyamino-, propionyl derivative, hydrochloride, A., 1040.  
 $4$ -Ethoxyquinoline-3-carboxylic acid, 6-nitro-2-hydroxy-, A., 528.  
 $6$ -Ethoxyquinoline-4-carboxylic acid, A., 1040.  
 $\alpha$ -6-Ethoxy-8-quinolyl- $\gamma$ -allylthiocarbamide hydrochloride, A., 522.  
 $2$ -Ethoxy-2:3:5:5-tetraphenyl-2:5-dihydrofuran, A., 518.  
 $\beta$ -Ethoxy- $\alpha\alpha\beta$ -triphenylethan- $\alpha$ -ol, A., 41.  
 $\beta$ -Ethoxyisovaleric acid, ethyl ester, A., 831.  
 Ethyl, free, existence of, A., 717.  
 preparation of, A., 40.  
 Ethyl alcohol, manufacture of, (P.), B., 443, 459.  
 from Jerusalem artichokes, B., 699.  
 from ethylene, (P.), B., 251, 670, 832.  
 by fermentation, (P.), B., 573, 1004.  
 from molasses, etc., (P.), B., 444.  
 from cane molasses, B., 397.  
 by fermentation of molasses or yeast, B., 957.  
 from oil-refinery gases, B., 762.  
 recovery of, in celluloid manufacture, B., 59.  
 purification of, with activated carbon, B., 398.  
 dehydration of, B., 330; (P.), B., 94, 700, 716.  
 denaturing of, (P.), B., 94.  
 use of isopropyl alcohol as denaturant for, B., 42.  
 apparatus for distillation of, (P.), B., 911.  
 rectification of, B., 397, 859.  
 absorption spectra of, in liquid and gaseous states, A., 444.  
 Raman spectrum of, A., 793.  
 electrode potential of, A., 230.  
 heat of combustion of, A., 341.  
 heat of mixing of, with isomyl alcohol and water, A., 1091.  
 boiling point of, A., 219.  
 vapour pressure of mixtures of ethyl acetate and, A., 1197.  
 density of mixtures of, with petroleum distillation products, A., 330.  
 specific volume of, A., 566.  
 adsorption of, by cellulose and cellulose acetate, A., 1084.  
 effect of alkali halides on surface tension of aqueous solutions of, A., 1200.  
 Ethyl alcohol, surface composition of aqueous solutions of, A., 992.  
 equilibria of, with acetic acid, ethyl acetate, and water, A., 117.  
 with benzene or toluene and water, A., 801.  
 with ethyl ether and water, A., 913.  
 with silica gel, A., 16.  
 liquid-vapour equilibria of water and, B., 911.  
 miscibility of gasoline and, B., 7.  
 combustion of, by homeotherms, A., 647, 1061.  
 catalysis by hydrogen chloride of esterification of acetic acid by, A., 578.  
 esterification in, A., 1210.  
 rate of esterification of, in acetic acid, A., 1002.  
 oxidation of, in air, in presence of catalysts, A., 579.  
 by enzyme of yeast, A., 1289.  
 catalytic oxidation of, A., 129.  
 reactions of, on nickel-chromium catalysts, A., 819.  
 preparation of ethylene from, A., 1108.  
 conversion of, into citric acid by moulds, A., 1065.  
 in blood, and its relation to intoxication, A., 540.  
 passage of, into human parotid saliva, A., 1162.  
 pure, isolation of, from non-alcoholic tissues, A., 637.  
 absolute, manufacture of, B., 42; (P.), B., 251.  
 heat consumption in, B., 280, 398, 573.  
 preparation of pure powdered hydrated lime and, (P.), B., 44.  
 injected, biological action of, A., 1162.  
 detection and determination of, in tissues, A., 958.  
 determination of, in small quantities, A., 41, 250.  
 areometrically, B., 398.  
 in mixtures with butyl alcohol, B., 55.  
 in presence of methyl alcohol, A., 763.  
 in motor fuels, B., 297.  
 in tinctures, B., 240.  
 in vinegars, B., 910.  
 determination in, of reducing impurities, by the Barbet test, B., 204.  
 of propyl alcohol, in mixtures with water, A., 1149.  
 of isopropyl alcohol, B., 250.  
 Ethyl alcohol,  $\beta$ -amino-, dinitrate, and its homologues, manufacture of, (P.), B., 56.  
 tribromo-, manufacture of, (P.), B., 927.  
 manufacture of stable liquid products of, (P.), B., 1019.  
 derivatives of, A., 367.  
 Ethyl  $\beta$ -amino- $\alpha$ -iminoethyl ether, and  $\beta$ -chloroacetamido-,  $\beta$ -benzamido-, and  $\beta$ -2-thiophenamido-iminoethyl ethers, hydrochlorides of, A., 936.  
 arsenite, chloro-, A., 937.  
 isomyl carbonate, A., 1018.  
 bromide, effect of intensive drying on distillation and vapour pressure of, A., 329.  
 gaseous, thermal dissociation of, A., 815.  
 decomposition of, A., 1002.  
 $\alpha\beta$ -dibromo- and  $\alpha$ -chloro-isobutyl ethers, A., 361.  
 $\beta\beta\beta$ -tribromoethyl ether, A., 367.  
 sec.-butyl ether, A., 719.  
 carbonate, reaction of, with Grignard reagents, A., 43.

Ethyl chloride, solubility of, in hæmatin solutions, A., 301.  
 effect of hæmoglobin or its derivatives on, A., 300.  
 $\gamma\gamma$ -dimethyloctyl ether, A., 44.  
*N*-diphenylurethane, A., 1239.  
 esters and iodides, X-ray data for, A., 326.  
 Ethyl ether, structure of, A., 1078.  
 manufacture of, (P.), B., 636.  
 from ethylene, (P.), B., 251.  
 treatment and packaging of, (P.), B., 414.  
 packaging of, (P.), B., 172.  
 containers for, (P.), B., 415\*.  
 preservation of, (P.), B., 670.  
 absorption spectra of, in liquid and gaseous states, A., 444.  
 Raman spectrum of, A., 676, 1076.  
 effect of potential difference on, A., 9.  
 surface tension of, A., 1078.  
 cryoscopy of, in potassium chloride solutions, A., 804.  
 in water and sodium chloride solutions, A., 570.  
 specific volume of, A., 566.  
 gaseous, thermal decomposition of, A., 474.  
 two liquid states of, A., 329.  
 equilibrium of, with antimony chloride, A., 1206.  
 with ethyl alcohol and water, A., 913.  
 stabilisation of, by copper, B., 540.  
 explosion of, B., 251.  
 explosions and autoxidation of, B., 56.  
 autoxidation of, A., 1017.  
 decomposition of, at low pressures, A., 1094.  
 mechanism of catalytic decomposition of, by acid chlorides and anhydrides, A., 718.  
 decomposition of mixtures of, with acetone and methyl ether, A., 1209.  
 hydrolysis of, A., 1232.  
 reaction of, with phosphorus pentachloride, A., 929.  
 compound of, with titanium tetrachloride, A., 1008.  
 action of, on serum, A., 1053.  
 detection of peroxides in, B., 12, 56.  
 determination of, in presence of water, ethyl alcohol, and acetaldehyde, A., 1149.  
 in Tinct. Valerianæ ætherca, B., 240.  
 Ethyl iodide, determination of small quantities of, A., 928.  
 mercaptan, additive compound of, with formaldehyde, A., 1114.  
 nitrite, deterioration and assay of solutions of, B., 1054.  
 assay of spirit of, B., 575.  
*o*-phenylene phosphite, A., 379.  
 1:8-phthalyl- $\beta$ -naphthyl ether, A., 1130.  
 selenate, explosibility of, A., 484.  
 sulphide, dichloro-, detection and determination of, A., 929.  
 Ethylamine, catalytic decomposition of, A., 478.  
 compound of, with ferric inositolphosphate, A., 1127.  
 complex compounds of lithium halides and, A., 124.  
 Ethylaminobarbituric acid, 5-bromo- $\beta$ -hydroxy-, A., 283.  
 1-Ethylaminobenzthiazole-5-carboxylic acid, derivatives of, A., 1267.  
 4-Ethylaminophenylarsinic acid, 3-amino- and 3-nitro-hydroxy-, A., 1049.  
 4-Ethylamino-2-phenylquinoline, A., 623.  
 8-Ethylaminoquinoline, 8- $\beta$ -amino-, dihydrochloride, A., 281.

*l*-Ethylamylcarbinol, and its  $\alpha$ -naphthylurethane, A., 144.  
 4-Ethyl-4-*iso*amyl-3:5-diketopyrazolidine, A., 1143.  
 1-Ethyl-4(5)-amyl-2-hexylglyoxaline, and its salts, A., 371.  
*N*-Ethylanabasine, and its salts, A., 758.  
 Ethylaniline, equilibrium of, with aniline and diethylaniline, A., 594.  
 complex salt of, with cuprous chloride, A., 376.  
 $\alpha$ - and  $\beta$ -Ethyl-*l*-arabinosides, A., 543.  
*d*- and *l*-Ethylbenzenes,  $\alpha$ -chloro-, formation of, from *l*-phenylmethylcarbinol, A., 611.  
 $\alpha$ -*N*-Ethylbenzylaminoethylideneacetone, A., 257.  
 $\beta$ -Ethylbutyl alcohol, salts of, A., 142.  
 Ethylbutylamine, b.p. of, A., 846.  
 $\beta$ -(Ethylbutylamino)ethanol, b.p. of, and its cinnamate hydrochloride, A., 846.  
 1-Ethyl-4-butyl-2-amylglyoxaline, and its salts, A., 371.  
 Ethyldi-*n*-butylarsine, and its derivatives, A., 1120.  
*l*-Ethylbutylcarbinols, and their  $\alpha$ -naphthylurethanes, A., 143.  
 $\beta$ -(Ethylbutyl)malonic acid, diethyl ester, A., 142.  
 2- $\gamma$ -Ethyl-*n*-butylresorcinol, A., 860.  
 $\alpha$ -Ethyl-*n*-butyric acid,  $\alpha$ -cyano-, chloride, A., 526.  
 Ethylcarbamide,  $\alpha$ -hydroxy- $\beta\beta\beta$ -tribromo-, and its diacetyl derivative, A., 1114.  
 Ethylcarvacrol, and its derivatives, A., 1139.  
 Ethylcarvone, and its derivatives, A., 1139.  
 Ethylcellulose, synthesis of, A., 370.  
 manufacture of, B., 976.  
 influence of water on viscosities of solutions of, B., 302.  
 Ethylcellulose, hydroxy-, enzymic hydrolysis of, A., 304.  
*trans*- $\alpha$ -Ethyleinnamic acid, dibromide, A., 208.  
 Ethyldi-*n*-amylarsine, and its oxide, A., 1120.  
 Ethyldi-*n*-amylstibine, A., 866.  
 Ethyldi-*n*-butylstibine, A., 866.  
 Ethyldicyclohexylarsine, and its methiodide, A., 1120.  
 Ethyldicyclohexylstibine, A., 866.  
 Ethyldihydro- $\alpha$ -naphthylisoindazole-3-carboxylic acids, A., 864.  
 10-Ethyl-5:10-dihydrophenarsazine, 5-nitroso-, A., 630.  
 2- $\alpha$ -Ethyl-4-(3':4'-dimethoxyphenyl)thiazole, 2- $\alpha$ -hydroxy-, and its benzoyl derivative, A., 758.  
 3-Ethyldiphenyl sulphide, 4-hydroxy-, A., 844.  
*N*-Ethyldiphenylbenzamidines,  $\alpha$ -chloro- and nitro-, A., 386.  
 Ethylditolylstibines, A., 866.  
 Ethyldocosylmalonic acid, and its ethyl ester, A., 720.  
 Ethylene, preparation of, from ethyl alcohol, A., 1108.  
 purification of, and production of ethyl alcohol therefrom, (P.), B., 832.  
 and its halogen derivatives, spectra of, A., 675.  
 near infra-red absorption spectrum of, A., 6.  
 and its derivatives, diamagnetism and structure of, A., 795.  
*M/N* ratio for, A., 479.  
 heat capacity and energy of formation of, A., 988.  
 value of  $C_p$  for, A., 1189.

Ethylene, adsorption of, by gold, A., 223.  
 by gold and iron, A., 1199.  
 inhibition of, by sulphuric acid, A., 1085.  
 thermal decomposition of bromine and, on glass, A., 819.  
 influence of hydrogen on pyrolysis of, A., 701.  
 combination of, with hydrogen, A., 815, 1095.  
 derivatives, oxidation of, (P.), B., 973.  
 dibromide, synthesis of, from acetylene and hydrogen bromide, A., 1232.  
 reaction of, with potassium iodide, A., 475.  
 and dichloride, dielectric constants of, A., 677.  
 electric moments of, A., 1190.  
 dichloride, boiling points and specific gravities of mixtures of carbon tetrachlorides and, A., 243.  
 chlorohydrin, preparation of, A., 1109.  
 dipole moment and free rotation of, A., 899.  
 $\alpha\gamma$ -dichlorohydrin, formation of glycol ethers from, A., 928.  
 diiodohydrins, and their esters, A., 928.  
 sulphate, A., 250.  
 effect of, on ripening of bananas, B., 362.  
 treatment of tomatoes with, B., 79.  
 calorimetric determination of, in gas mixtures, B., 247.  
 determination in, of carbon monoxide, B., 250.  
 Ethylene, dichloro-, production of, (P.), B., 493.  
 physical properties of, A., 329.  
 as a refrigerant, B., 659.  
 as solvent, A., 802.  
 di- and tri-chloro-, action of aluminium chloride on, A., 717.  
 di-, tri-, and tetra-chloro-, reaction of, with formaldehyde, A., 721.  
 trichloro-, manufacture of, (P.), B., 878.  
 stability of, B., 1113.  
 oxidation of, (P.), B., 332.  
 tetrachloro-, photo-oxidation of, in carbon tetrachloride solution, A., 1215.  
 halogeno-derivatives, nitration of, A., 718.  
 tetraiodo-, molecular compound of, with dioxan, A., 719.  
 nitro-derivatives, additive reactions of, A., 730.  
 Ethylene glycol, manufacture of, from ethylene, (P.), B., 670.  
 dipole moment and free rotation of, A., 898.  
 specific heat of, A., 1197.  
 influence of, on some reactions, A., 477.  
 arsenite, A., 937.  
 ethyl ether. See Cellosolve.  
 triphenyl methyl ether, A., 42.  
 Ethylene oxide, oxygen valency angle and electric moment of, A., 1190.  
 production of, (P.), B., 878.  
 reaction of, with diethylamine, A., 935.  
 detection of, B., 1010.  
 Ethylenediaminophenylene-4:4'-distibinous oxide, A., 867.  
 Ethylenediamine, manufacture of, (P.), B., 973.  
 dipole moment and free rotation of, A., 899.  
 additive compound of, with cellulose, A., 149.  
 Ethyleneisopropylenedipiperidinum salts, A., 524.  
 Ethylenic compounds, infra-red absorption spectra of, A., 559.  
 Raman spectra of, A., 7.  
 influence of substitution on vibration frequencies of, A., 676.

- Ethyl- $\beta$ -ethylbutylbarbituric acid, A., 142.  
hypnotic action of, A., 191.
- Ethyl- $\beta$ -ethylbutylmalonic acid, diethyl ester, A., 142.
- Ethylethylenediamine salts, *N*- $\beta$ -bromo-, A., 256.
- O-Ethylevernic acid, and its derivatives, A., 742.
- 5-Ethyl-2-furoic acid, and its nitrile, A., 1255.
- Ethyl-*d*-glucosides, A., 1237.
- 1-Ethylglyoxaline, 1- $\beta$ -hydroxy-, and 2-thiol-1- $\beta$ -hydroxy-, A., 864.
- $\alpha$ -Ethyl-*n*-hexadecic acid, and its derivatives, A., 720.
- $\beta$ -Ethylhexanol, and its derivatives, B., 250.
- 2- $\beta$ -Ethylcyclohexanol, and its phenylurethane, A., 1241.
- $\delta$ -Ethylhexan- $\gamma$ -one, and its semicarbazone, A., 368.
- 4-Ethyl-4-hexyl-3:5-diketopyrazolidine, A., 1143.
- $\alpha$ -Ethyl-( $\alpha$ -hydroxy- $\beta\beta\beta$ -trichloroethyl)carbamide,  $\alpha$ - $\alpha$ -hydroxy- $\beta\beta\beta$ -tribromo-, and its derivatives, A., 1114.
- 2- $\alpha$ -Ethyl-4-(3'-4'-*d*-hydroxyphenyl)thiazole, 2- $\alpha$ -hydroxy-, benzoyl derivative, A., 758.
- Ethylideneacetone, dihydroxy-, A., 367.
- Ethylidenebisdi-indone, A., 1252.
- Ethylidenebisnitroanilines,  $\beta\beta\beta$ -tribromo-, A., 1124.
- Ethylidenediketohydrindenedi-indone, A., 1252.
- Ethylideneglyceraldehyde, A., 367.
- Ethylideneglycerols, bromo-, isomeric, and their derivatives, A., 42.
- Ethylideneglycerol- $\alpha$ -carboxylactones, and their derivatives, A., 599.
- Ethylidenedithiocarbamic acid, diisobutyl-, diethyl-, and dipropyl-ethylideneammonium salts, A., 150.
- Ethylimidazolidone, *N*- $\beta$ -hydroxy-, A., 257.
- 1-Ethyl-1'-methyl-2:2'-carboquinoprycyanine iodide, A., 756.
- Ethylmorphine, distinction between codeine and, A., 178.
- 2-Ethyl- $\alpha$ -naphthol, and its picrate, A., 734.
- 3-Ethyl- $\alpha$ -naphthol, and its picrate, A., 843.
- 4-Ethyl- $\alpha$ -naphthyl methyl ketone, and its derivatives, A., 512.
- Ethyl-3-nitrophthalimide, and  $\beta$ -bromo-, A., 1231.
- Ethyl nitrosoisopropyl ketone, A., 602.
- $\gamma$ -Ethyl-*Δ*<sup>8</sup>-octadiene, A., 41.
- $\gamma$ -Ethyl-*Δ*<sup>4</sup>-octadiene, A., 40.
- Ethylloxazolidine, 2-imino-3- $\beta$ -bromo- and -3- $\beta$ -chloro-, salts of, A., 256.
- $\gamma$ -Ethylpentane, preparation of, and its reaction with benzoyl peroxide, A., 250.
- $\beta$ -Ethylpentanol, and its derivatives, B., 250.
- $\alpha$ -Ethylphenol, A., 844.
- Ethyl- $\beta$ -phenoxyethylpyrrolinium iodide, A., 622.
- 5-Ethyl-1-phenyl-3-methylbarbituric acid, A., 283.
- 4-Ethylphenylthiocarbamide, A., 154.
- 4-Ethylphenylthiocarbimide, A., 154.
- 6-Ethylphylloporphyrin, synthesis of, and its methyl ester, A., 173.
- 4-(Ethylpiperazinoethylamino)-6-methoxy-2-methylquinoline, 4:4'- $\beta$ -amino-, picrate, A., 168.
- 2-Ethylpiperidylpropionic acid,  $\beta$ -hydroxy-, derivatives of, A., 759.
- $\beta$ -Ethyl- $\alpha$ -propenylglutaric acid, and its derivatives, A., 1119.
- Ethylisopropylamine, b. p. of, A., 846.
- $\beta$ -(Ethylisopropylamino)ethanol, b. p. of, and its benzoate hydrochloride, A., 846.
- $\gamma$ -(Ethylisopropylamino)propanol, b. p. of, and its benzoate hydrochloride, A., 846.
- $\alpha$ -Ethyl- $\alpha$ -isopropylbutyronitrile, A., 727.
- Ethyl  $\beta$ -propyl ketone, and its derivatives, A., 44.
- $\epsilon$ -Ethyl-8-propylnonan-8-ol- $\zeta$ -one, A., 499.
- 1-Ethyl-7-isopropylphenanthrene, A., 1254.
- Ethylpyrazoline hydrochloride, 4-chloro-5- $\alpha\beta$ -dichloro-, A., 754.
- 6-Ethylpyridine, 2-hydroxy-, A., 522.
- 6-Ethyl-2-pyridone-3-carboxylic acid, A., 522.
- 2-Ethylquinoline,  $\beta$ -amino-, derivatives of, A., 167.
- Ethylneostyrychnidinium salts, A., 406.
- $\beta$ -Ethylstyrene,  $\beta$ -bromo-, A., 269.
- Ethylsulphonium derivatives,  $\beta$ -hydroxy-, A., 251.
- $\alpha$ -Ethyl-*n*-tetracosic acid, and its 2:4:6-tribromoanilide, A., 720.
- Ethyltetradecylmalonic acid, and its ethyl ester, A., 720.
- Ethylthiazolidine, 2-imino-3-bromo- and -3-chloro-, and their salts, A., 256.
- Ethylidithiocarbamic acid, and nitroso-, iron salts, A., 32.
- Ethylthiocarbimide, effect of, on sulphur metabolism in rabbits, A., 964.
- N*-Ethylthiodiphenylamine mono- and di-mercuriacetates, A., 631.
- Ethylthioglyceride, dimeric, A., 45.
- 2-Ethylthiolbenzamide, A., 148.
- 2-Ethylthiolglucose 1:1-diethylmercaptal, and its 3:4:5:6-tetrabenzoate, A., 148.
- 2-Ethylthiol-*al*-glucose 3:4:5:6-tetrabenzoate, A., 148.
- 2-Ethylthiol-4-hydroxymethyluracil, A., 952.
- 2-Ethylthiolrotic acid, A., 952.
- 2-Ethylthiol-6-thiocarbimido-4-methylpyrimidines, and their thiourethanes, A., 755.
- 2-Ethylthiol-6-thiocyano-4-methylpyrimidine, rearrangement of, and its derivatives, A., 755.
- 2-Ethylthiolthiophen, A., 752.
- Ethylthioxyloside, and its triacetate, A., 45.
- Ethyl-*p*-toluenesulphonimidodisulphine-*p*-toluenesulphonylimine,  $\beta$ -chloro-, A., 1017.
- Ethyl-*m*-toluic acid, 2-hydroxy-5- $\alpha\beta\beta$ -tetrachloro-, A., 849.
- 1'-Ethyl-1:3:3-trimethyl-2:2'-carboquinocyanine iodide, A., 756.
- Ethyluracil-4(6)-carboxylic acid, ethyl ester, A., 66.
- 7-Ethyluramil, 5-bromo-, A., 283.
- Ethylurethane, effect of administration of, on urine, A., 190.
- poisoning by. See under Poisoning.
- Ethylvalerophenone, A., 1240.
- Ethylxanthic acid, and  $\beta$ -hydroxy-, copper salts, A., 718.
- dimethyleneammonium salt, A., 48.
- 2:4:6-*tri*bromophenyl ester, A., 843.
- Eucalyptol, disubstituted derivatives of, A., 619.
- detection of, colorimetrically, B., 400.
- Eucalyptus oil, uses of, B., 80.
- commercial, B., 128.
- Formosan, B., 206.
- South African, B., 623.
- Eucopintoxin hydrochloride for preparation of vaccine virus, A., 95.
- Eudalene, synthesis of, A., 941.
- Eugenol, fluidity of, A., 566.
- iso*Eugenol, manufacture of, (P.), B., 138.
- Eugenol-6-azo-*p*-phenylarsinic acids, and their salts, A., 528.
- Eugenyl-5-oxamic acid, 4-hydroxy-, A., 1244.
- Euphorbia marginata*, seed of, A., 204.
- Euphyllin, effect of, on colloidal osmotic pressure of blood in nephrectomy, A., 540.
- Eupomotis*. See Sunfish.
- Europeans in the tropics, basal metabolism and protein consumption of, A., 772.
- Europium, in A-type stars, A., 441.
- magnetic susceptibility, gyromagnetic ratio and heat capacity of, A., 217.
- Eutectic points, lowering of, A., 691, 913.
- Evaporation, A., 988.
- of liquids, (P.), B., 822.
- of organic liquids, B., 331.
- of solutions in analysis, hot-ring for, A., 926.
- from large surfaces, B., 963.
- cathodic, in a magnetic field, A., 790.
- Evaporation apparatus, (P.), B., 131, 486, 708, 965, 1061.
- using exhaust steam, (P.), B., 708.
- vacuum pans for, (P.), B., 822.
- for solutions, (P.), B., 486.
- for syrups, (P.), B., 822.
- vacuum, A., 37; (P.), B., 533.
- Evaporation rings, photographic study of, A., 211.
- Evaporators, (P.), B., 1060, 1108.
- adjuster equipment for, (P.), B., 917.
- deposits on steam side of tubes of, B., 451.
- vacuum, heating of, (P.), B., 964.
- circulation in, B., 163.
- Evening primrose, effect of radium on, A., 206.
- Everdur metal, B., 309.
- Evernic acid, constitution of, and its esters, A., 742.
- diacetyl derivative, A., 1258.
- Ewes, pregnant, ingestion of potassium iodide by, A., 1164.
- Excreta, plant for disposal of, at Kyoto, Japan, B., 210.
- Explosions, theory of, A., 233.
- regions of, A., 917.
- limits of, A., 1001.
- pressures in waves of, A., 1001.
- propagation of, through glass and rubber tubes, A., 1001.
- gaseous, A., 1001.
- theory of, A., 344, 473.
- kinetics of, A., 701.
- initiation of, by small flames, A., 915.
- limits of, A., 127.
- photographic record of flame movements in, A., 232.
- Explosives, (P.), B., 482, 529, 578, 753, 914.
- manufacture of, (P.), B., 450, 625, 753.
- from glucosides, (P.), B., 914.
- from plant tissues and sodium nitrate, (P.), B., 529.
- from starch, (P.), B., 529.
- application of Schlieren photography to investigations on, B., 625.
- measurement of available energy of, B., 658.
- igniting power of, B., 625.
- detonation of, A., 1210; B., 208.
- disturbance propagating detonation in, B., 529.
- determination of detonation velocities of, B., 208, 209.
- decomposition of, on detonation, B., 208.
- unimolecular decomposition of, A., 1003.
- use of cuprene in, B., 528.
- priming composition for, (P.), B., 49, 81, 625, 753, 1010.
- repairs to plant containing, B., 1057.

**Explosives**, ammonium nitrate, sensitised by ammo-compounds, (P.), B., 753.  
 B-powder, containing vaseline or centralite, variation of  $f_p dt$  with charging density for, B., 289.  
 black powder, manufacture of, (P.), B., 865, 1057.  
 blasting and propellant, determination of moisture in, B., 208.  
 chlorate, manufacture of, (P.), B., 753.  
 nitrate, anti-oxidation catalysis and stabilisation of, B., 786.  
 nitrocellulose and nitroglycerin, production of, B., 322.  
 nitrocellulose propellant, (P.), B., 81.  
 for percussion caps, priming compositions for, (P.), B., 242.  
 powder, propellant, (P.), B., 1010.  
 priming, crystals of, A., 11.  
 propellant, (P.), B., 81, 529.  
 manufacture of, (P.), B., 753.  
 colloidal, combustion of, B., 289.  
 powder, flashless, (P.), B., 450.  
 SD powder, ballistic stability of, B., 752.  
 for shell, (P.), B., 1010.  
 smokeless powder, determination of stability of, B., 289.  
 Bergmann-Junk stability test on, B., 529.  
 vaseline used in, B., 209.  
 for hunting and practice, (P.), B., 289.  
 nitrocellulose, manufacture of, (P.), B., 129.  
 nitroglycerin-nitrocellulose, stability test of, B., 289.  
 determination in, of alkali nitrites, B., 401.  
 solid, production of, (P.), B., 818.  
 laws of combustion of, B., 528.  
 testing of, B., 624.  
 Trauzl lead-block test for, B., 1010.  
 detection in, of perchlorates, B., 752.  
 determination of gases in testing galleries for, B., 208.  
**Extensometer**, A., 565.  
**Extinction coefficients** of organic compounds, A., 674.  
**Extraction** of liquids, B., 659.  
**Extraction analysis**, A., 1101.  
**Extraction apparatus**, A., 357, 593, 1226; (P.), B., 4, 453, 532, 580, 756.  
 for liquids, (P.), B., 1061.  
 centrifugal, aperiodic mounting for, (P.), B., 132.  
 condensation pump, efficiency of, B., 628.  
 laboratory, for large quantities of materials, A., 138.  
 rotary, for fats, oils, etc., (P.), B., 85.  
 Soxhlet, A., 246, 593, 1226.  
**Extractum thymi fluid**, evaluation of, B., 527.  
**Exudates**, lipins and proteins of, A., 768.  
**Eyes**, constituents of lens and humours of, A., 77.  
 effect of naphthalene on oxidation in lens of, A., 190.  
 "Ezoyanagi," digestion of wood of, B., 1022.

## F.

**Fabrics**, machines for moistening and cooling of, (P.), B., 720.  
 boiling of, without pressure, B., 144.  
 compositions for cleaning of, (P.), B., 589.  
 machines for steaming of, (P.), B., 419.  
 multi-tier tentering and drying machines for, (P.), B., 597.

**Fabrics**, treatment of, (P.), B., 19.  
 rinsing liquid for, after washing, (P.), B., 337.  
 with varnishes, etc., (P.), B., 1025.  
 apparatus for treatment and ageing of, (P.), B., 596.  
 shrinking of, (P.), B., 100.  
 desizing of, B., 978.  
 coating material for, (P.), B., 235.  
 coating of, with bituminous materials, (P.), B., 798.  
 with pyroxylin, (P.), B., 839.  
 with rubber and cellulose derivatives for wearing apparel, (P.), B., 1076.  
 fastness to light of, B., 381.  
 colouring and decorating of, by spraying, (P.), B., 640.  
 composition for use in ornamentation of, (P.), B., 932.  
 crêping of, (P.), B., 883.  
 production of designs on, with light, (P.), B., 1117.  
 hand-painting on, (P.), B., 517.  
 impregnation of, with cellulose, (P.), B., 338.  
 with bitumen for roofs, etc., (P.), B., 1076.  
 fireproofing of, (P.), B., 545.  
 fireproofing and waterproofing of, (P.), B., 933.  
 waterproofing of, B., 544; (P.), B., 722.  
 preservatives for, (P.), B., 465.  
 effect of chlorates on combustibility of, B., 769.  
 detection of defects in, B., 795.  
 aeroplane. See Aeroplane fabrics.  
 balloon. See Balloon fabrics.  
 coloured, perspiration tests on, B., 1026.  
 cotton. See Cotton fabrics.  
 crêpe, production of, (P.), B., 883.  
 woven, production of, (P.), B., 880.  
 dyed, recording of colours on, by spectro-analysis, B., 839.  
 decolorisation of, (P.), B., 931, 1118\*.  
 gas-absorbent, production of, (P.), B., 16.  
 gas-imperious, (P.), B., 224, 335, 675, 722.  
 for airships, etc., (P.), B., 18.  
 laundered, testing of, B., 835.  
 linen. See Linen fabrics.  
 mildew-proof, manufacture of, (P.), B., 677.  
 pile, coating reverse side of, (P.), B., 504.  
 glass-paper, etc., for surface dressing of, (P.), B., 336.  
 fur pile, fur for, (P.), B., 178.  
 weft pile, treatment of, prior to cutting, (P.), B., 719.  
 printed, drying of, (P.), B., 722.  
 rubber-coated, manufacture of, (P.), B., 503.  
 for air bags, treatment of, (P.), B., 503.  
 rubber-proofed, tendering of, B., 143.  
 rubberised, production of, (P.), B., 932.  
 silk. See Silk fabrics.  
 textile, treatment of, (P.), B., 932.  
 drying of, (P.), B., 144.  
 apparatus for, (P.), B., 883.  
 scouring of, (P.), B., 839.  
 conditioning of, (P.), B., 257, 503.  
 impregnation and coating of, (P.), B., 639.  
 coating of, with rubber, (P.), B., 1044.  
 impregnation of, with rubber, (P.), B., 179.  
 crêping of, (P.), B., 979.  
 strength of, B., 835.  
 occurrence and detection of faults in, B., 381.

**Fabrics**, textile, with cut pile threads, production of, (P.), B., 1026.  
 waterproof, elastic, (P.), B., 304.  
 woven, machines for bleaching and washing of, (P.), B., 99.  
 apparatus for shrinking and stretching of, (P.), B., 596.  
 containing lead, for clutch facings, (P.), B., 16.  
 determination in, of copper, B., 503.  
**Fæces**, metabolism in formation of, A., 295.  
 androkinin in, A., 1068.  
 stercobilin and porphyrins from, A., 296.  
 vitamin content of, A., 312.  
 determination in, of fat, A., 295.  
*Fagus sylvatica*. See Beech, red.  
**Faraday effect**, variation of, with concentration, A., 794.  
 thermal variation of, A., 678.  
 in ferromagnetics, A., 324.  
 in liquid mixtures, A., 678.  
 in molecules, A., 1077.  
**Ferrolite**, A., 715.  
**Fasting**, latent period of autolysis in, A., 193.  
 fat transport through lymph in, A., 878.  
**Fat or Fats**, report of International Commission on, B., 69.  
 report of Pan-European Commission No. 4 on, B., 69.  
 extraction of, B., 611; (P.), B., 435.  
 with benzene from hydrogenation plants, B., 993.  
 expressing of, from seeds, etc., (P.), B., 233.  
 recovery of, from emulsions, etc., (P.), B., 649.  
 from slaughter-house offal, carcasses fish, etc., (P.), B., 785.  
 purification of, (P.), B., 435.  
 apparatus for refining of, (P.), B., 1039.  
 bleaching of, (P.), B., 806, 947.  
 rendering of, B., 193; (P.), B., 391.  
 dry rendering of, (P.), B., 648.  
 apparatus for melting of, (P.), B., 30.  
 hardening of, with nickel carbonyl, B., 777.  
 oxygen absorption of, B., 776.  
 solubility of, B., 29.  
 solidification curves of, in solvents B., 29.  
 chemistry of, A., 365; B., 116.  
 isolation of fatty acids of, B., 193.  
 antioxidants of, B., 29, 355, 559, 1124.  
 antioxidant action of aniline and its derivatives on, B., 29.  
 dehydrogenation of, B., 354.  
 hydrogenation of, B., 233, 805.  
 nickel carbonate-kieselguhr mixture for, B., 979.  
 formation of isoacids in, B., 993.  
 preparation of alcohols by high-pressure reduction of, A., 1017.  
 saponification of, (P.), B., 474.  
 amidic saponification of, B., 946.  
 fractional saponification of, B., 946.  
 Twitchell splitting reagents for, B., 29.  
 formation of sugar from, A., 770.  
 preservation of, (P.), B., 649, 1090.  
 stabilisation of, (P.), B., 1039.  
 rancidity of, B., 269.  
 effect of light on, B., 1039.  
 chemistry of, B., 849.  
 "ketone-rancidity" in, B., 515.  
 detection of rancidity of, B., 849.  
 determination of rancidity of, B., 899.  
 manufacture of polymerisation products of, (P.), B., 233.  
 changes in, during frying, B., 805.  
 deterioration of, in foods, B., 621.

- Fat or Fats**, decomposition of, by micro-organisms, A., 93.  
 as nutriment for growth, A., 538.  
 effect of glandular secretions on intestinal dehydrogenation of, A., 1171.  
 sparing action of, on vitamin-B, A., 657.  
 in rats, A., 781.  
 edible, production of emulsions of, (P.), B., 526, 1007.  
 fatty acids of, B., 269.  
 manufacture of products of, (P.), B., 435.  
 detection of adulteration of, B., 69.  
 analyses of, B., 1125.  
 determination in, of higher saturated fatty acids, B., 647.  
 of solid unsaturated fatty acids, B., 784.  
 partly hydrogenated, component glycerides of, A., 498.  
 seed, fatty acids and glycerides of, B., 354.  
 vegetable, production of, B., 647.  
 adsorption bleaching of, B., 559.  
 "aniline-point" of, B., 849.  
 Ubbelohde's dropping point of, B., 354.  
 hydroxyl number of, B., 849.  
 iodine value of, B., 29, 686.  
 partial iodine and thiocyanogen values of, B., 515.  
 oxygen number of, B., 1089.  
 saponification for determination of Reichert-Meissl value of, B., 1125.  
 determination of smoking point of, B., 69.  
 from eating chocolate, unsaponifiable value of, B., 29.  
 use of iodometric acidimetry in analysis of, B., 69.  
 steam distillation in analysis of, B., 849.  
 use of cellosolve in analysis of, B., 946.  
 detection of aldehydes formed by oxidation of, B., 612.  
 detection and determination of, by Marchand's method, B., 434.  
 determination of, (P.), B., 116.  
 in feeding-stuffs, B., 399.  
 volumetrically, in milk, etc., (P.), B., 996.  
 in organs, A., 1055.  
 determination in, of phosphorus, B., 1125.  
**Fatigue**, influence of acidosis and alkalosis on onset of, A., 537.  
**Fatty substances**, rotary cooling drums for, (P.), B., 292.  
 rendering of, (P.), B., 777.  
**Fayalite**, heat of formation of, A., 1092.  
**Feathers**, keratin of, A., 1274.  
**Feeding-stuffs**, manufacture of, (P.), B., 127, 160, 286, 622.  
 from holly leaves, etc., (P.), B., 747.  
 apparatus for cooling and screening of, (P.), B., 405.  
 manufacture of pellets of, (P.), B., 1103.  
 preservation of, (P.), B., 702.  
 nutritive value of, B., 446.  
 productive energy of, A., 876.  
 effect of leaching on plants used as, B., 205.  
 castor seed in, B., 861.  
 use of sugar in, B., 160.  
 value of sugar materials as, A., 86.  
 leaves of sugar beetroots as, B., 206.  
 action of cellulose-splitting bacteria on, A., 968.  
 serum diagnosis of, A., 666.  
 digestibility by chickens of nitrogen-free extracts of, A., 876.  
 cattle, vitamin requirements in, A., 423.  
 green, correlation between plant characteristics and properties of, B., 702.  
 preservation of, (P.), B., 622.  
**Feeding-stuffs**, mixed, determination of salt and molasses in, B., 445.  
 poultry, digestibility of, A., 772.  
 from rice, B., 574.  
 containing sugar, B., 286.  
 vegetable, reduction capacity of, in relation to vitamin-C, A., 658.  
 evaluation of, from digestive nutrient content, B., 1006.  
 detection in, of corn-cockle, B., 526.  
 determination in, of fats, B., 399.  
 of molasses, B., 480.  
**Fehling's solution**, A., 692.  
 reduction of, A., 582.  
*Feijoa sellowiana*, iodine in fruits of, A., 663.  
**Felspar**, isomorphism of, A., 595.  
 fusion tests on, B., 343.  
 gases from heating of, in vacuo, B., 546.  
 relation of soda-lime ratio to blending of, B., 342.  
 pegmatic, A., 1229.  
 perthitic, formation of, A., 1229.  
 potash and soda, melting of mixtures of flint and, B., 23.  
 determination in, of iron, B., 723.  
**Felt**, coating of, with varnish, (P.), B., 227.  
 core, manufacture of, (P.), B., 720.  
 gun-wad, manufacture of, (P.), B., 224.  
 paper-makers' "drying," manufacture of, (P.), B., 720.  
**Felted materials**, containing bitumen, production of, (P.), B., 720.  
**Fence posts**, wooden, preservation of, in Western Australia, B., 385.  
**Fenchane**, preparation of, A., 857.  
 *$\beta$ -apoFenchane*, preparation of, A., 857.  
*apoisoFenchene*, and its nitrosochloride, A., 1037.  
*dl-Fenchocamphorones*, hydrazones, acetyl derivatives of, A., 857.  
**Fenchone**, isomeric oximes of, and their benzoyl derivatives, A., 1133.  
*dl-isoFenchone* hydrazone, and its acetyl derivative, A., 857.  
*dl-Fenchyl alcohol*, from American pino oil, and its derivatives, A., 619.  
**Fenton's reaction**, A., 917.  
**Fenugreek seeds**, reserve polysaccharide of, A., 660.  
**Ferments**. See **Enzymes**.  
**Fermentation**, theories of, B., 1004.  
 specificity in, A., 195.  
 flasks for, (P.), B., 911.  
 of sugars, A., 305.  
 polarographic study of products of, B., 443.  
 acetic, physiology of, A., 94, 196.  
 alcoholic, A., 144, 148, 194, 1167.  
 nomenclature of catalysts for, A., 428.  
 action of organic compounds on, A., 1288.  
 in presence of asparagino and aspartic acid, A., 1288.  
 alcoholic and lactic, effect of phosphatase in, A., 1065.  
 citric, A., 1169; B., 859.  
 lactic, of warm-blooded animals, A., 298.  
 lactic bacterial, inhibition of, by halogeno-aliphatic acids, A., 654.  
 panary, effect of  $p_H$  on, B., 481.  
 composition for use in, (P.), B., 126.  
 proteolytic and lipolytic, (P.), B., 525.  
**Fermentation industries**, B., 239.  
**Fermented liquors**, determination in, of carbon, B., 1102.  
**Ferns**, hard, control of, by spraying with arsenic pentoxide, B., 698.  
**Ferric salts**. See under **Iron**.  
**Ferricyanides**, crystal structure of, A., 903.  
 effect of potassium cyanide on oxidation-reduction potential of, A., 1000.  
 catalysis of oxidation of unsaturated compounds by, A., 128.  
 oxidation by, A., 712.  
 of alkaloids, A., 1147.  
 See also under **Hydroferricyanic acid**, salts.  
**Ferrioxalic acid**, potassium salt, photolysis of solutions of, A., 28.  
**Ferrites**, ferromagnetism and structure of, A., 985.  
**Ferroberyllium**, determination in, of beryllium, B., 427.  
**Ferrobilin**, and its methyl ester, A., 627.  
**Ferrocerium**, Curie point of, A., 562.  
**Ferrochromium**, production of, (P.), B., 608, 987.  
 refining of, (P.), B., 683.  
 chlorination of, (P.), B., 383.  
 anodes. See under **Anodes**.  
 determination in, of chromium, electro-metrically, B., 149.  
**Ferrocyanides**, application of, in analysis, A., 1012.  
 of alkaloids, A., 1147.  
 double, use of, in analysis, A., 825.  
 See also under **Hydroferrocyanic acid**, salts.  
**Ferromagnetic metals**. See under **Metals**.  
 moments of related elements, A., 112.  
 powders, magnetisation of, A., 562.  
 substances, rotation polarisation of, A., 215.  
 thermoelectric properties of, A., 324.  
 Faraday effect in, A., 324.  
 in alternating electromagnetic fields, A., 218.  
 magnetostriction in, A., 13.  
 specific heat of, A., 112.  
 permeability of, A., 449.  
 disperse, A., 226.  
 isotropic, magnetic properties of, A., 112, 1191.  
**Ferromagnetism**, A., 324, 900, 1077.  
 theory of, A., 13.  
 and electrical properties, A., 449, 900, 984.  
 of solids, A., 324.  
**Ferromanganese**, production of, from manganese ores from Nikopol basin, B., 508.  
 anodes. See under **Anodes**.  
**Ferronickel**, treatment of alloys of chromium and, (P.), B., 609.  
**Ferrophosphorus**, production of ferric phosphate from, (P.), B., 227.  
 low-silicon, production of, (P.), B., 682.  
**Ferrosilicon**, B., 427.  
 atomic moment and Curie point of, A., 686.  
 manufacture of, (P.), B., 608.  
 as by-product in manufacture of alkaline-earth aluminates, (P.), B., 1078.  
 recovery of, from boiler ash, (P.), B., 471.  
**Ferrosilite**, A., 926.  
**Ferrotitanium**, preparation of, B., 149.  
**Ferrotungsten**, determination in, of tin, B., 644.  
**Ferrous salts**. See under **Iron**.  
**Ferrovanadium**, determination in, of vanadium, B., 149.  
**Ferrum pulveratum**, distinction between ferrum reductum and, B., 304.  
**Ferrum reductum**, action of, A., 1283.  
 distinction between ferrum pulveratum and, B., 304.  
**Ferry ions**. See under **Iron**.

Fertilisers, manufacture of, (P.), B., 40, 75, 125, 479, 523, 618, 654, 745, 1003.  
 from calcium phosphate and ammonia, (P.), B., 955.  
 from Khibin apatite, B., 545.  
 from magnesite, (P.), B., 935.  
 from phosphate rock, (P.), B., 21.  
 relative heats of solution of, B., 37.  
 colouring of, B., 158.  
 aqueous ammonia as, B., 567.  
 brown coal as, B., 74, 618.  
 dicyanodiamide as, B., 618.  
 magnesium as, B., 395, 567.  
 molasses as, B., 953.  
 utilisation of phosphorus waste from matches in, B., 744.  
 hygroscopic properties of salts in, B., 566.  
 sewage sludge as, B., 694, 706, 866.  
 town sewage containing effluent from cellulose factories as, B., 694.  
 use of silicic acid as, B., 38.  
 utilisation of intestinal slimes as, B., 395.  
 application of, (P.), B., 1048.  
 requirement and application of, in dry areas, B., 318.  
 use of, in Germany, B., 694.  
 comparative effects of manures and, B., 124, 782.  
 action of, on soil micro-organisms, B., 1129.  
 on soil reaction and crop yields, B., 1129.  
 excavating apparatus for removal of, from heaps, (P.), B., 238.  
 waxed paper coated with, (P.), B., 596.  
 ammonium nitrate, manufacture of, (P.), B., 955.  
 prevention of caking of, (P.), B., 745.  
 ammonium magnesium phosphate, manufacture of, (P.), B., 955.  
 granular, manufacture of, B., 395; (P.), B., 524.  
 hygroscopic, storage of, (P.), B., 40.  
 inorganic, influence of, on soils, B., 38.  
 lime, titration of basic constituents of, B., 952.  
 mixed, manufacture of, (P.), B., 21, 75, 125, 261, 442, 745, 783, 908, 955, 956, 1003.  
 from ammonium nitrate and sulphate, (P.), B., 618.  
 from ammonium thiosulphate, B., 180.  
 non-caking, manufacture of, (P.), B., 238.  
 nitrate, determination of nitrogen in, B., 201.  
 nitrogenous, B., 569.  
 manufacture of, (P.), B., 21, 202.  
 effect of, on soil acidity, B., 158.  
 influence of chlorides and sulphates on nitrification of, B., 522.  
 for cereals, B., 123, 695.  
 effectiveness of, for cotton, B., 123.  
 effect of, on wheat and barley, B., 123.  
 physiological reaction of, B., 37.  
 organic, technology of, B., 38.  
 phosphate, manufacture of, (P.), B., 238, 980.  
 composition, solubility, assimilability and analysis of, B., 781.  
 efficiency of, B., 617.  
 action of, B., 1046.  
 availability of, as shown by Neubauer method, B., 617.  
 influence of soil reaction on phosphoric acid intake from, B., 782.  
 determination in, of phosphoric acid, B., 567.  
 of phosphorus, B., 124.  
 of potash, B., 597.

Fertilisers, phosphate and potassium, manufacture of, (P.), B., 102.  
 potash, production of, (P.), B., 1048.  
 from New Mexican polyhalite, B., 883.  
 properties of, B., 694.  
 effect of, on crops, B., 567.  
 on water consumption, B., 123.  
 influence of magnesium phosphate on action of, B., 782.  
 manurial trials with, B., 478.  
 for protection against frost injury, B., 317.  
 physiological reaction of, B., 37.  
 sodium and potassium nitrate, production of, from sylvinite, B., 124, 1002.  
 determination in, of phosphoric acid, A., 487; B., 276.  
 of urea-nitrogen, B., 201.  
 Fervanite, A., 38.  
 Feulgen's reaction, A., 314.  
 Fibres, production of, (P.), B., 881, 977.  
 from agaves, etc., (P.), B., 797.  
 from plants, (P.), B., 768, 769.  
 from unretted plant stalks, (P.), B., 882, 931\*.  
 extraction of, from vegetable matter, (P.), B., 416.  
 apparatus for treatment of, (P.), B., 720.  
 treatment of, for papermaking, etc., (P.), B., 1075.  
 with rubber latex, (P.), B., 933.  
 cleansing of, (P.), B., 256.  
 machine for scouring of, (P.), B., 502.  
 comminution of, (P.), B., 976.  
 apparatus for rubbing of, (P.), B., 1075.  
 spinning of, in precipitating baths, (P.), B., 500.  
 measurement of length of, B., 835.  
 use of waste from, as fuel, (P.), B., 977.  
 stain for, for microscopy, B., 15.  
 Abacá. See Abacá fibres.  
 animal, treatment of, (P.), B., 256, 461, 677.  
 reaction of ammonium chloride solutions with, B., 1076.  
 manufacture of artificial leather from, (P.), B., 338.  
 felted, production of, (P.), B., 811.  
 medullated and pigmented, structure of, A., 415.  
 animal and vegetable, X-ray structure of, A., 798.  
 artificial, dry-spinning device for, (P.), B., 795.  
 cutting into lengths of bundles of, (P.), B., 303.  
 uniting of, with lecithin, B., 716.  
 bast, production of, from plant stalks, (P.), B., 18, 596.  
 fibrillar structure of, B., 176.  
 cellulose. See Cellulose fibres.  
 dyed, fading of, B., 418.  
 glass. See Glass fibres.  
 lignified, decomposition of, (P.), B., 142.  
 quartz. See Quartz fibres.  
 staple, manufacture of, (P.), B., 1116.  
 from filaments or threads, (P.), B., 675.  
 textile, molecular structure of, A., 451.  
 production of, from rags containing artificial silk, (P.), B., 223.  
 treatment of, (P.), B., 542.  
 apparatus for degumming, etc., of, (P.), B., 931.  
 finishing of, (P.), B., 596.  
 size for, (P.), B., 304.  
 sizing of, (P.), B., 722.  
 catalysis in deterioration of, B., 60.  
 measurement of breaking strength and extensibility of, B., 59.

Fibres, textile, animal and vegetable, cleaning of, (P.), B., 223.  
 artificial, spinning of, B., 1073.  
 unbleached sulphite, determination of, B., 673.  
 vegetable, production of, (P.), B., 542.  
 treatment of, (P.), B., 256.  
 mordanting of, for dyeing with acid and chrome dyes, B., 978.  
 retting of, (P.), B., 461.  
 fastness of dyes on, B., 336.  
 vulcanised, treatment of, (P.), B., 98.  
 dot-count method of analysis of, B., 879.  
 use of zyanin in analysis of, B., 716.  
 Fibre board, manufacture of, (P.), B., 768, 1025.  
 production of pulp for, (P.), B., 1025.  
 silicating of, (P.), B., 978.  
 for building, B., 308.  
 Fibrin, determination of, in blood-plasma, A., 183.  
 Fibrinogen, A., 227.  
 isoelectric point of, A., 530.  
 antigenic properties of, A., 183.  
 denatured, isoelectric point of, A., 530.  
 Fibroin, manufacture of solutions of, (P.), B., 460.  
 manufacture of aqueous solutions of, (P.), B., 499.  
 concentration of aqueous solutions of, (P.), B., 880.  
 production of salt solutions of, (P.), B., 796.  
 manufacture of artificial materials from solutions of, (P.), B., 461.  
 Fibroskin, B., 1093.  
 Fibrous articles, manufacture of, (P.), B., 502.  
 water-resistant, manufacture of, (P.), B., 141.  
 Fibrous blocks, manufacture of, (P.), B., 141.  
 Fibrous materials, production of, (P.), B., 223, 595.  
 from bagasse, etc., (P.), B., 461.  
 purification of, (P.), B., 931.  
 laundering of, (P.), B., 767.  
 dispersing and cleansing agents for, (P.), B., 545.  
 wetting agents for, (P.), B., 495, 797.  
 drying of, (P.), B., 163.  
 treatment of, (P.), B., 596, 722, 796.  
 for pulping, (P.), B., 639.  
 for manufacture of paper pulp, mill-boards, etc., (P.), B., 303.  
 sizing and finishing of, (P.), B., 144.  
 digestion of, (P.), B., 638, 720.  
 sulphite cooking of, (P.), B., 462.  
 coating of, with rubber, (P.), B., 999.  
 coating compositions for, (P.), B., 1041.  
 impregnation of, (P.), B., 1027.  
 materials for, (P.), B., 258.  
 with rubber, (P.), B., 463, 1027.  
 stiffening of, (P.), B., 418.  
 production of loosely distended masses of, (P.), B., 977.  
 production of dry plates of, from wet material, (P.), B., 502.  
 manufacture of press-moulded articles from, (P.), B., 675.  
 production of sheets of, (P.), B., 142.  
 composite materials of cellulose materials and, (P.), B., 883.  
 laminated, manufacture of, (P.), B., 638.  
 non-inflammable, manufacture of, (P.), B., 597.  
 coated with synthetic resins, drying of, (P.), B., 418.  
 rubberised, production of, (P.), B., 418, 930.



- Fibrous materials, synthetic, manufacture of, (P.), B., 223.**  
 vegetable, treatment of, (P.), B., 461.  
 decomposition of, (P.), B., 16.  
 silicification of, (P.), B., 258.  
 manufacture of boards, etc., from, (P.), B., 1025.  
 production of silk-like lustre on, by coating, (P.), B., 144.  
 waterproof, (P.), B., 416.  
 moulded waterproof, manufacture of, (P.), B., 97.
- Ficus, rubber content of, B., 563.**
- Figs, dried, vitamin content of, A., 1173.**  
 Kadota, glacé, production of, B., 1103.
- Filaments, artificial, manufacture of, (P.), B., 303, 336, 500, 675, 767, 881, 930, 931.**  
 by dry-spinning process, (P.), B., 883.  
 spinning jet for, (P.), B., 462.  
 manufacture and winding of, (P.), B., 883.  
 spinning of, (P.), B., 417.  
 support for treatment of, in cake form, (P.), B., 257.  
 stretching of, (P.), B., 930.  
 twisting and winding of, (P.), B., 18.  
 of reduced lustre, manufacture of, (P.), B., 930.  
 hollow, manufacture of, (P.), B., 796.  
 oxide-coated, emission from, A., 110, 208.  
 rubber. See Rubber filaments.
- Filicic acid, hæmolytic action of derivatives of, A., 414.**
- Films, molecular area and volume in, A., 794.**  
 which adsorb atomic hydrogen but not molecular hydrogen, A., 1034.  
 interfacial, determination of area of adsorbed molecules in, A., 333.  
 light-sensitive, A., 460.  
 liquid, formation of, A., 992.  
 balanced-layer theory of, A., 17.  
 on vertical wetted plates, A., 333.  
 surface, calculation of molecular dimensions from equation of state for, A., 17.  
 thin, A., 333.  
 physical properties of, A., 460.  
 unimolecular, A., 333.
- Filters, (P.), B., 86, 132, 164, 293, 453, 486, 532, 580, 662, 821, 868, 916, 1108.**  
 medium for, (P.), B., 788.  
 discharging of, (P.), B., 373.  
 granulometric test of sand for, B., 707.  
 for air, (P.), B., 325, 486, 869.  
 cleaning of, (P.), B., 486.  
 for air and gases, (P.), B., 293, 630.  
 for gases, (P.), B., 454, 486, 581, 868, 1109.  
 for gases and liquids, (P.), B., 821.  
 for liquids, (P.), B., 212, 372, 533, 1109.  
 for oils, (P.), B., 4, 629.  
 replaceable-element for, (P.), B., 662.  
 for petrol, etc., (P.), B., 1013.  
 for small quantities of materials, A., 37.  
 for smoke for respirators, (P.), B., 486.  
 for cleaning solvents, gasoline, etc., (P.), B., 917.  
 for wells, (P.), B., 293.  
 air-pressure, (P.), B., 212.  
 asbestos, for determination of urea, A., 293.  
 continuous, fluid pressure discharge for, (P.), B., 86.  
 electro-. See Electro-filters.  
 glass and quartz, for gases, A., 1226.  
 light. See Light filters.  
 multi-layer, (P.), B., 406.  
 rotary, (P.), B., 629.  
 pressure, (P.), B., 212.
- Filters, rotary-drum, (P.), B., 4.**  
 vacuum, (P.), B., 965.  
 thickening, (P.), B., 212.
- Filter cloths, method for attachment of, (P.), B., 373.**
- Filter presses, (P.), B., 4, 325, 629, 788, 917, 964.**  
 leaves for, (P.), B., 486, 708.  
 withdrawal of filtrate from, (P.), B., 406.  
 tapered-tube, (P.), B., 373.
- Filtration, abnormal potential of, A., 25.**  
 continuous laboratory, A., 713.  
 electro-. See Electro-filtration.  
 vacuum, A., 358.
- Filtration apparatus, (P.), B., 86, 133, 212, 373, 407, 453, 486, 532, 581, 662, 821, 965, 1061.**  
 for high temperatures, A., 1106.  
 for low temperatures, A., 1106.  
 rapid, A., 1226.  
 vacuum, A., 1014.
- Fir, Douglas, fumigation of seeds of, B., 1097.**
- Firearms, steel, prevention of corrosion of, (P.), B., 1086.**
- Fireblight, control of, B., 908.**
- Firebricks, manufacture of, (P.), B., 601.**  
 action of coal-ash slags on, B., 1080.  
 slag and spalling tests on, B., 262.  
 with more than 90% of grog, B., 64.  
 from Missouri hard-flint clay, B., 24.
- Fireclay refractories. See under Refractories.**
- Firedamp, detectors for, (P.), B., 329.**
- Fire-extinguishers, (P.), B., 485, 579, 1062.**  
 composition for, (P.), B., 405.  
 filling for, (P.), B., 452.  
 production of foam for, (P.), B., 85, 452, 823.  
 foam stabilisers for, (P.), B., 821.  
 liquid for, (P.), B., 485.  
 production of snow for, (P.), B., 84.  
 for chimneys, (P.), B., 85, 708.  
 carbon dioxide, shield for, (P.), B., 407.
- Fireflies, male lampyrid, luminescence of, A., 1162.**
- Fireproof material for archival documents, (P.), B., 431.**
- Fireproofing, agents for, (P.), B., 303.**  
 composition for, (P.), B., 724.  
 impregnating materials for, B., 937.  
 of cellulose materials, (P.), B., 931.  
 of fabrics, (P.), B., 933.  
 of wood, etc., (P.), B., 107.
- Fireworks, detonating compositions for, (P.), B., 81.**
- Fish, composition of, A., 871.**  
 treatment of, (P.), B., 960.  
 salting of, for curing, (P.), B., 1135.  
 curing of, (P.), B., 622, 702.  
 preservation of, B., 366; (P.), B., 447, 816.  
 detection of hexamethylenetetramine in preservatives for, B., 1005.  
 cold storage of, B., 366.  
 freezing of, (P.), B., 750.  
 freezing of water in muscle of, B., 1005.  
 poisonous tropical plants for, B., 698.  
 effect of carbon dioxide on bacterial growth in, B., 749.  
 phosphatides in, B., 366.  
 influence of drying temperature on digestibility of proteins in, B., 1134.  
 respiratory metabolism of, A., 1150.  
 elasmobranch, absorption and excretion of water and salts by, A., 1277.  
 liver oils of, B., 1039.  
 vitamin reserves in, A., 433.  
 elasmobranch, and teleost, phosphatase in, A., 193.
- Fish, oily and white, relative value of diet of, A., 1283.**  
 salted, reddening of, B., 784.  
 bacteria in, B., 655.  
 waste, treatment of, (P.), B., 816.  
 "Fish guano," Argentine, B., 1046.
- Fish liver oils, unsaponifiable fraction of, A., 636.**  
 reaction of, with antimony trichloride, A., 1174.  
 analytical classification of, B., 1126.
- Fish meal, odourless drying of, (P.), B., 656.**  
 nitrogen-balance in, B., 701.  
 vitamin-A and proteins in, B., 701.  
 German, phosphatides in, B., 366.
- Fish oils, B., 994.**  
 rotary boilers for production of, (P.), B., 946.  
 extraction of, (P.), B., 996.  
 cracking of, B., 560.  
 vitamin-A from, A., 200.  
 of the Volga-Caspian territory, B., 560.  
 determination of unsaponifiable matter in, B., 233.
- Fish refuse. See under Refuse.**
- Fixatives, penetration of, A., 958.**
- Flames, action of transverse electrostatic fields on, A., 557.**  
 electron motion in, A., 209.  
 temperatures of, A., 25.  
 internal friction and density in, A., 906.  
 movement of, A., 1001.  
 photographic record of, in gas explosions, A., 232.  
 measurement of speed of, A., 701.  
 law of speeds of, A., 232.  
 combustion reactions in, B., 488.  
 diffusion, application of, B., 919.  
 luminous, combustion conditions in, B., 52.  
 determination of temperature and total radiation from, B., 584.  
 sensitive, A., 358.
- Flashlight powder, time of combustion of, B., 786.**
- Flasks, shaking, use of, A., 1013.**
- Flavanic acid, salts, decomposition of, by wool, A., 1182.**  
 with biogenic amines, A., 726.
- Flavines, detection and determination of, B., 637.**
- Flavines, thio-, constitution and colour in, A., 67.**
- Flavinic acid, bufotenin salts of, A., 1142.**
- Flavone, dihydroxy-, and 3':4':5'-trihydroxy-, and its derivatives, A., 620.**  
 5:7:8-trihydroxy-, possible identity of, with hydroxychrysin, A., 620.  
 5:7:8:4'-tetrahydroxy-, and its acetyl derivative, A., 64.  
 5:7:3:4':5'-penta-hydroxy-, A., 1256.  
 tri-, tetra-, and penta-hydroxy-, and their acetyl derivatives, A., 621.
- Flavones, spectrography of, A., 620.**  
 absorption spectra of, A., 64.  
 relation between absorption of light and hydroxyl substituents in, A., 620.  
 interaction of, with anthocyanins, A., 750.  
 pharmacology of, A., 541.
- isoFlavone group, syntheses in, A., 859.**
- Flavone series, rearrangement in, A., 621.**
- Flavonol, 3:3':4':5'-tetrahydroxy-, A., 1256.**
- Flax, fertilisers for, B., 695.**  
 oil in growth of, for fibre and for seed, A., 663; B., 735.  
 removal of seeds from, (P.), B., 675.  
 fibre, effect of soil type and fertilisers on, B., 123.  
 retted, pectic substances in, B., 255.

Flax seed, oil tests on, B., 398.  
 Flax waste, cottonising of, B., 140.  
 Flies, preparation for killing of, (P.), B., 130, 962.  
   sprays against, for dairy cows, B., 523.  
   black. See *Aleurocanthus woglumi*.  
   blow-, baits for attraction of, B., 754.  
   house, green-bottle and black blow-, insecticides for, B., 210.  
   Mediterranean fruit, insecticides for, in Florida, B., 278.  
   warble, B., 394.  
 Flint, formation of, A., 595.  
   melting of mixtures of potash- and soda-felspar and, B., 23.  
 Flocculation of sols by electrolytes, A., 336.  
 Floors, materials for construction of, B., 842; (P.), B., 800.  
   coverings for, (P.), B., 345, 550, 998.  
   manufacture of, (P.), B., 425.  
   decoration of, (P.), B., 437, 650.  
   printing of, (P.), B., 602, 902.  
   printing pastes for, (P.), B., 235.  
   laminated coverings for, (P.), B., 642.  
   rubber coverings for, (P.), B., 359, 520.  
   rubber materials for, (P.), B., 34, 359.  
   compositions for surfacing of, (P.), B., 425.  
   cone-nine vitrified tile body for, B., 306.  
   waterproof coverings for, (P.), B., 597.  
   wooden coverings for, (P.), B., 107.  
   fireproof, production of, (P.), B., 184.  
 Floor blocks, mastic composition for laying of, (P.), B., 1042.  
 Flores *verbasci*. See under Mullen.  
 Florescence, B., 342, 679.  
 Flotation, (P.), B., 350, 964.  
   theory of, A., 333, 1085.  
   electrostatic theory of, A., 119; B., 645.  
   bubble attachment in, B., 645.  
   physical chemistry of, A., 343; B., 347, 553.  
   promoter activity of alkyl xanthates in, B., 66.  
   reaction products of phosphorus pentasulphide and cresol as agents for, B., 681.  
   sulphurised phenols for use in, (P.), B., 763.  
   of hydrophilic and hydrophobic powders, A., 1200.  
   of minerals, B., 427, 470.  
 Flour (*wheat flour*), by-products from manufacture of, (P.), B., 1007.  
   grinding apparatus for, (P.), B., 485.  
   degree of grinding of, B., 655.  
   acceleration of bleaching of, with benzoyl peroxide, B., 1052.  
   effect of bleach on ageing of, B., 860.  
   loss of bread substance in baking of, B., 365.  
   baking quality of, B., 283.  
   properties of ether-soluble constituents in relation to, B., 747.  
   experimental baking test on, B., 748.  
   apparatus for determination of tenacity and elasticity of, B., 700.  
   heat of hydration of, B., 282.  
   variation in weight of given volume of, B., 747, 1052.  
   swelling of, B., 159.  
   suspensions, surface tension of, A., 691.  
   testing of, with the pachimeter, B., 867.  
   quick ashing of, B., 620.  
   fermentation tolerance in, B., 620.  
   development of diastatic enzymes in, B., 572.

Flour, sugar formation by diastatic enzymes in, B., 573.  
   diastatic power and baking quality of, B., 860.  
   proteolytic power of, B., 860.  
   determination of protein extractability of, B., 283.  
   sugars, diastatic activity, and "gassing power" of, B., 860.  
   effect of, on hæmoglobin regeneration, A., 868.  
   barley. See Barley flour.  
   cake, testing of, B., 282.  
   for cakes and pastry, viscosity test on, B., 621.  
   from hard red spring wheat, effect of bleaching agents on, B., 444.  
   potato. See Potato flour.  
   rye. See Rye flour.  
   self-raising and phosphated, determination of ash content of flour in, B., 282.  
   soft, fermentation of, B., 911.  
   testing of, B., 860.  
   examination of, in Wood's light, B., 365.  
   detection in, of rye and barley, B., 239.  
   determination of acidity of, B., 365; 620.  
   determination in, of ash by the magnesium acetate-alcohol method, B., 860.  
   of cellulose, B., 444.  
   of dry gluten, B., 655.  
   of nitrogen by Kjeldahl's method, B., 621.  
   of proteins, moisture and ash, B., 1051.  
 Flour pastes, acid,  $p_{H}$  of, B., 239.  
 Flow, capillary, high-pressure, B., 867.  
 Flow, stream-line, heat transfer in, B., 323.  
 Flowmeters, apparatus for calibration of, A., 592.  
   multiple-range, A., 592.  
 Flow sheets, B., 1107.  
 Flowers, carotenoids of, A., 1257.  
 Flue dust, micro-photographs of, B., 404.  
 Flue gases. See under Gases.  
 Fluidity of mixtures, A., 330.  
 Fluoberyllates. See under Beryllium.  
 Fluorane, *mono-* and *di-amino-di-hydroxy-*, A., 266.  
   3:6-dinitro-2:7-dihydroxy-, use of, in detection of sugars, A., 1238.  
 Fluoranthene, and its derivatives, A., 847.  
 Fluoranthene, 12-amino-, and its derivatives, A., 847.  
 Fluoranthene-12-carboxylic acid, and its derivatives, A., 847.  
 Fluorene, condensation of, with nitrobenzene, A., 610.  
   derivatives, dipole moments of, A., 677.  
 Fluorene, 9-amino-, dehydrogenation of, A., 377.  
   acetyl derivative, nitration of, A., 386.  
   1:2-diamino-, diacetyl derivative, A., 1252.  
   3-nitro-, A., 153.  
*aci*-Fluorene, 9-nitro-, salts of, A., 939.  
 1:2-Fluorene, 1:2-diamino-, diacetyl derivative, A., 516.  
 Fluorene series, A., 1251.  
   nitration in, A., 163.  
 Fluorene-carboxylic acid, nitration of, and *mono-* and *di-amino-*, and their acetyl derivatives, and *mono-* and *di-nitro-*, A., 1129.  
 Fluorene-9:9-dicarboxylic acid, diethyl ester, A., 614.  
   crystal structure of, A., 798.  
 Fluoreno-*mono-* and *-di-aminophenanthrazines*, A., 1043.  
 Fluoreno-2-bromophenanthrazine, A., 1043.

Fluoreno-*mono-* and *-di-hydroxyphenanthrazines*, A., 1043.  
 Fluorenone, 2:7-diamino-, *mono-* and *di-nitro-*, and nitroamino-, and their derivatives, A., 164.  
 Fluorenones, substituted, preparation of, A., 386.  
 Fluorenone-2-arsinic acid, 7-amino-, derivatives of, and their sodium salts, and 7-hydroxy-, and its acetyl derivatives, A., 761.  
 Fluorenone-1-carboxylic acid, 2-bromo-, and 2-nitro-, A., 848.  
 Fluorenone-1-carboxylic-6-propionic acid, and its dimethyl ester, A., 847.  
 Fluorenedicarboxylic acids, and their derivatives, A., 847.  
 Fluorenone-7-glycine-*p*-acetophenonylamide-2-arsinic acid, and its sodium salt, A., 761.  
 Fluorenone-7-glycineanilide-2-arsinic acid, and its sodium salt, A., 761.  
 Fluorenone-7-glycinemethylamide-2-arsinic acid, and its sodium salt, A., 761.  
 Fluorenone-1-propionic acid, 2-bromo-, A., 848.  
 Fluoreno-*mono-* and *-di-nitrophenanthrazines*, A., 1043.  
 Fluorenophenanthrazine, A., 1043.  
 Fluorenylaniline, and its derivatives, A., 610.  
 Fluorenylideneaniline oxide, A., 610.  
 Fluorescein, lactic derivatives of, and diamino-, dihydrochloride, A., 1141.  
 Fluorescein, dibromo-, preparation of, A., 400.  
   dibromodinitro-derivatives, absorption spectra of, A., 1258.  
 Fluorescence, A., 1076.  
   measurement of, A., 7, 821.  
   theory of extinction of, A., 1189.  
   and free neutral radicals, A., 110.  
   bacterial, A., 198, 430.  
 Fluorescent screens, (P.), B., 1057.  
 Fluoric acid. See under Fluorine.  
 Fluoricinic acid, and its derivatives, A., 526.  
 Fluorides. See under Fluorine.  
 Fluorine, atomic weight of, A., 106, 209, 317, 554, 670, 895, 980.  
   in natural phosphates, B., 382.  
   occurrence of, in foods and plants, and its determination, A., 1181.  
   atomic refractivity of, A., 323.  
   artificial disintegration of, by  $\alpha$ -particles, A., 318.  
   H-rays from, A., 1186.  
   heat of dissociation of, A., 698.  
   parachor of, A., 449.  
 Fluorine polyhalides, A., 1219.  
 oxide, heat of formation of, A., 23.  
 Hydrofluoric acid, pure, preparation of, A., 1100.  
   anhydrous, production of, (P.), B., 21.  
   and its salts, (P.), B., 260.  
   heat of formation of, A., 812.  
   crystalline, density of, and of its salts, A., 902.  
   liquid, density and surface tension of, A., 329.  
   low in silica, production of, (P.), B., 21.  
   effect of, on metabolism, A., 774.  
   action of, on the skin, A., 1060.  
 Fluorides, action of, with phosphorus pentachloride, A., 1100.  
   low-boiling, atomic radii of, A., 902.  
 Hypofluorous acid, preparation of, A., 485.  
 Fluoric acid, preparation of, A., 485.  
 Fluosilicates, preservation of wood with, B., 1120.

**Fluorine organic compounds**, A., 449, 585.  
 manufacture of, (P.), B., 251.  
 viscosity of, A., 329.  
 aromatic, A., 729, 1129.

**Fluorine determination**:—  
 determination of, A., 587; B., 382.  
 as calcium fluoride, A., 33.  
 in organic compounds, A., 1269.  
 in phosphate rock and phosphatic slags, B., 62.  
 in impregnated wood, B., 1032.

**Fluorite**, luminescence of, A., 793.  
 photo- and thermo-luminescence of, A., 983.  
 crystallography of, A., 714.  
 action of heat on, A., 596.

**Fluorophosphoric acid**. See under Phosphorus.

**Fluorosis**, plasma-phosphatase in cows with, A., 1278.

**Fluorosulphonic acid**, action of, on cellulose, A., 1022.  
 esters of, A., 708.

**Fluorspar**, phosphorescence of, excited by Schumann rays, A., 110.

**Fluosilicates**. See under Fluorine.

**Fluotitanates**. See under Titanium.

**Fluxes for brazing**, etc., (P.), B., 894.  
 for soldering, (P.), B., 473, 685, 943, 1037.

**Foam**, production of, for therapeutic substances, (P.), B., 1008.  
 apparatus for, (P.), B., 325.  
 compositions for, (P.), B., 540.  
 gelatinous preparations for, for medicinal purposes, etc., (P.), B., 527.  
 apparatus for reduction of, (P.), B., 629.

**Foaming**, abatement of, (P.), B., 821.

**Foaming agents**, manufacture of, (P.), B., 173, 221, 592, 793.

**Foliage**, adherence of copper dusts to, B., 954.

**Folliculin**, structure of, A., 1079.  
 rat and mouse units of, A., 1173.

**Fontinalis**, permeability of cells of, to alkaloid cations, A., 438.

**Foods**, production of, from animal tissue, (P.), B., 959.  
 from animal fish or vegetable matter, (P.), B., 750.  
 use of hygrometers in, B., 579.  
 cooling of, B., 366.  
 temperature changes in, during freezing and thawing, B., 1103.  
 specific dynamic action of, A., 299.  
 chemistry of, B., 239.  
 occurrence and determination of aluminium in, B., 702.  
 diastatic enzymes in, B., 574.  
 deterioration of fat in, B., 621.  
 manganese in, B., 285.  
 effect of saponins in, on health, A., 541.  
 vitamin-A content of, A., 782.  
 vitamins in, B., 621.  
 effect of cooking on nutritive value of, B., 750.  
 use of lemon juice in, B., 862.  
 oil emulsions for, (P.), B., 1007.  
 photochemical action as cause of rancidity of, B., 1053.  
 preservation of, (P.), B., 527, 622, 702.  
 by heat, B., 367.  
 rôle of acidity in, B., 784, 861.  
 with formic, benzoic, and sulphurous acids, B., 47.  
 with hexylresorcinol, B., 862.  
 preservatives for, (P.), B., 1053.  
 prevention of growth of moulds on, B., 1052; (P.), B., 816.  
 sterilisation of, by heat, B., 912.

**Foods**, cooking and sterilisation of, using steam, (P.), B., 862.  
 toxicity of, when prepared in aluminium vessels, B., 959.  
 relation of, to disease, B., 750, 958.  
 canning of, B., 862.  
 microbiology of, B., 862.  
 material for containers for, (P.), B., 18.  
 manufacture of cardboard or fabric containers for, (P.), B., 882.  
 metal containers for, (P.), B., 894.  
 machines for packing of, into sealed containers, (P.), B., 527.  
 Australian, refrigeration of, for their preservation and transport, B., 399.  
 canned, spoilage in, B., 367.  
 sterilisation of, B., 862.  
 poisoning bacteria in, B., 369.  
 vitamins in, B., 655.

**cereal**, B., 958.  
 breakfast, manufacture of, (P.), B., 1006.  
 Chinese, analyses of, B., 912.

**frozen**, micro-organisms affecting, B., 862.  
 heat-sterilised, rate of heat penetration in, B., 702.  
 for infants, manufacture of, (P.), B., 446.  
 mineral, manufacture of, (P.), B., 447.  
 perishable, freezing of, (P.), B., 750.  
 plant, reduction capacity of, in relation to vitamin-C, A., 316.  
 protein, utilisation of iron of, by albino rats, A., 963.  
 assay of, for vitamin-B<sub>12</sub>, A., 310.  
 methods of analysis of, B., 860.  
 detection in, of dimethyl diketone and acetylmethyl-carbinol, B., 749.  
 of methyl chloride, B., 51.  
 of salicylic and benzoic acids, B., 700.  
 detection and determination of fats in, B., 434.  
 determination in, of aluminium, B., 959.  
 of ammonia, trimethylamine and amines, B., 701.  
 of  $p_{\text{H}}$ , with the hydrogen electrode, B., 47.  
 of saccharin, B., 399.  
 of reducing sugars, colorimetrically, B., 857.  
 of sulphur with a turbidimeter, B., 1103.  
 of vitamins, A., 309.

**Food preserves**, use of lactic acid in, B., 285.

**Food products**, (P.), B., 750.  
 manufacture of, (P.), B., 526, 527.  
 drying of, (P.), B., 750.  
 freezing of, (P.), B., 286.  
 canning of, (P.), B., 656.  
 gelatin, manufacture of, (P.), B., 750.  
 treatment of, (P.), B., 127.

**Tripolitan**, composition of, B., 79.

**Footwear**, material for soles of, (P.), B., 257.

**Forests**, relation of composition and rate of growth of, to soil characteristics, B., 316.

**Formals**, simple, mixed, preparation of, A., 1232.

**Formaldehyde**, structure of, A., 1078.  
 in rain water, A., 1106.  
 formation of, by photo-reduction of carbonates, A., 349.  
 production of, from carbon dioxide, (P.), B., 886.  
 from hydrogen and carbon monoxide, (P.), B., 783.  
 from methane, (P.), B., 972.  
 vapour, infra-red absorption spectrum of, A., 558.

**Formaldehyde**, ultra-violet absorption spectrum of, A., 792.  
 vibration spectrum of, A., 897.  
 fluorescence of, A., 896.  
 photosynthesis of, A., 480.  
 decomposition of, A., 706.  
 condensation of, B., 117.  
 with arylamines, A., 840.  
 with phenols, A., 610.  
 production of condensation products from, (P.), B., 56.  
 condensation products of, with carbamide, (P.), B., 118.  
 with carbamide and its derivatives, (P.), B., 998.  
 with carbamide and thiocarbamide, (P.), B., 807.  
 manufacture of condensation products of aromatic sulphonamides and, (P.), B., 57, 173.  
 action of, with ammonium sulphide, A., 932.  
 on diazomethane, A., 367.  
 with di-, tri-, and tetra-chloroethylene, A., 721.  
 on aqueous solutions of potassium ferrocyanide, A., 235.  
 additive compounds of, with mercaptans, A., 1114.  
 aqueous, reaction products of, with ammonium and alkylammonium sulphides, A., 627.  
 trimethyleneacetal, A., 932.  
 manufacture of sucrose from, (P.), B., 1050.  
 degradation of, by acetic bacteria, A., 1289.  
 detection of, colorimetrically, with sodium nitroprusside and hydroxylamine, A., 145.  
 microchemically, in presence of hexamethylenetetramine, A., 1114.  
 in leather, B., 690.  
 in urine, A., 186.  
 determination of, A., 411.  
 polymerised, in dusting-powder mixtures, B., 75.

**Formaldoxime** as reagent in analysis, A., 491.

**Formaldoxime**, chlorobromo-, and diiodo-, hydrate of, A., 606.

**Formamide**, purification and physical properties of, A., 150.  
 dipole moment and free rotation of, A., 899.

**Formamidines**, disubstituted, preparation of, A., 508.

**o-Formanilides**, and their transformation into leuco-bases, A., 1024.

**Formic acid**, molecular structure of, A., 798.  
 production of, (P.), B., 221, 670.  
 from formates, (P.), B., 763.  
 extraction of, from aqueous solution by light petroleum, A., 331.  
 concentration of, (P.), B., 670.  
 absorption spectra of, in liquid and gaseous states, A., 444.  
 Raman spectrum of, A., 109.  
 specific heat of aqueous solutions of, A., 1091.  
 partition of, between water and toluene, A., 1198.  
 action of diazomethane on, A., 367.  
 preservation of foods with, B., 47.  
 salts, production of, (P.), B., 505.  
 electrochemical production of, from carbon dioxide, A., 1005.  
 alkaline-earth salts, production of, (P.), B., 261.

Formic acid, copper salts, isodimorphism of, A., 1198.  
ferrous salts, A., 42.  
potassium salt, production of, (P.), B., 421.  
conversion of, into the oxalate, A., 29.  
acid potassium salt, A., 1018.  
dodecyl ester, A., 44.  
ethyl ester, reaction of, with sodium ethoxide, A., 831.  
fenchyl esters, A., 619.  
*p*-halogenophenacyl esters, A., 744.  
complex vanadium compounds of, A., 31.  
degradation of, by acetic bacteria, A., 1289.  
detection of, in blood and tissues, A., 1154.  
detection in, of acetic acid with mercuric oxide, B., 540.  
determination of, volumetrically, in fruit juices, B., 815.  
Formic acid, chloro-, *d*- $\beta$ -octyl ester, formation of *d*- $\beta$ -chloro-octane from, A., 251.  
Formoxime, bromocyanamino-, dichloro- and chlorocyanamino-, A., 717.  
Formulæ, chemical, octet equations for, A., 680.  
2-Formyl-3-acetyl-5-carbethoxy-4-methylpyrrole, and its pyridazine derivative, A., 1045.  
Formylanhydrokalosapogenin, A., 398.  
4-Formylbenzyl alcohol, 3,5-di-hydroxy-, A., 61.  
Formylcellulose. See Cellulose formate.  
3-Formyl-2:4-dimethylpyrrole-5-carboxylic acid, anil of, A., 626.  
3-Formyl-6-methylbenzanilide, 2:4-di-hydroxy-, A., 61.  
5-Formyl-4-methyl-2- $\beta$ -carboxyethylpyrrole-3-carboxylic acid, derivatives of, A., 861.  
2-Formyl-1-methyl-1:5-di- $\Delta^2$ -isohexenyl- $\Delta^{2:4}$ -cyclohexadiene, A., 600.  
 $\alpha$ -Formylmethylmalonic acid, ethyl ester, phenylhydrazone, A., 601.  
5-Formyl-4-methyl-3-propyl-2-bromomethylpyrrole, A., 862.  
3-Formyl-4-methylpyrrole-2:5-dicarboxylic acid, A., 626.  
 $\alpha$ -Formylphenylacetoneitriles, condensation of, with phenols, A., 1140.  
2-Formyl-1:1:5-trimethyl- $\Delta^{2:4}$ -cyclohexadiene, and its semicarbazone, A., 600.  
Foundry cores. See under Cores.  
Fournau 769. See Ethyl- $\beta$ -ethylbutyl-barbituric acid.  
Fowl-pox, adsorption and elution of virus of, A., 94.  
Fractionation, (P.), B., 454.  
Fractionation apparatus, (P.), B., 51, 137.  
centrifugal, (P.), B., 965.  
Frauenhofer lines, intensity in, A., 440.  
Freezing of solutions, A., 124, 340, 1204.  
rapid, B., 445, 784.  
Freezing mixtures, A., 1225.  
Freezing point, apparatus for thermoelectric determination of, A., 1105.  
composition for lowering of, (P.), B., 84.  
effect of inert adsorbents on, A., 1194.  
of aqueous solutions, A., 912.  
Friction, viscous, A., 454.  
Friction materials, (P.), B., 473, 487, 965.  
manufacture of, (P.), B., 1062.  
for brakes, etc., (P.), B., 454.  
for clutch rings, etc., (P.), B., 487.  
Friedel and Crafts' reaction, A., 49, 1129.  
in aliphatic and hydroaromatic series, A., 44.  
mixed catalysts for, A., 235.  
with non-aromatically combined hydrogen, A., 141.  
with polyanhydrides of dibasic acids, A., 1233.

Fries reaction, A., 273.  
Frits, semi-rotary furnaces for melting of, B., 725.  
*Fritillaria roylei*. See Pei-Mu.  
Frogs, behaviour of heterocyclic compounds in, A., 189.  
winter, carbohydrates of muscle of, A., 77.  
Fructose, physical properties of, and its determination, A., 835.  
photolysis of, A., 237.  
oxidation of, by ammoniacal methylene-blue, A., 933.  
reduction of, at dropping mercury cathode, A., 1237.  
crystalline esters derived from, A., 1237.  
modification of Selivanov and Ihl-Pechmann reactions for, A., 369.  
bacterial decomposition of, A., 1066.  
fermentation of glucose and, by yeast, A., 651.  
conversion of, into lactic acid by tissues, A., 1160, 1278.  
determination of, A., 603.  
colorimetrically, A., 723.  
See also Lævulose.  
 $\alpha$ -Fructose chlorotetraacetate, structure of, A., 603.  
Fructose anhydride, formation of, by thermal degradation of inulin, A., 1022.  
Fructosediphosphoric acid, derivatives of, A., 929.  
 $\beta$ -*h*-Fructosidase. See Invertase.  
Fruits, enzyme content of, A., 1296.  
iron content of, A., 665.  
effect of  $p_H$  on inactivation temperature of oxidase in, A., 542.  
reducing substances in, A., 658.  
distribution of vitamin-B in, A., 200.  
effect of potash manuring on colour, state, and storage quality of, B., 123.  
detection of abrasions in, (P.), B., 446.  
disinfection of, (P.), B., 1007.  
effect of solid and gaseous carbon dioxide on transient diseases of, B., 1048.  
control of mites on, B., 908.  
spray residues on, B., 744.  
artificial colouring of, (P.), B., 1103.  
ripening of, A., 435.  
preservation of, (P.), B., 526, 912.  
storage of, (P.), B., 1135.  
preparations of, containing vitamins, (P.), B., 575.  
canned, effect of  $p_H$  on, B., 702.  
deciduous, changes in ripening of, A., 974.  
dehydrated, removal of sulphur dioxide from, (P.), B., 912.  
dried, preservation of, with sulphur dioxide, B., 861.  
fresh, proximate composition of, B., 481.  
preservation of, (P.), B., 750.  
by freezing, (P.), B., 399.  
composition for, (P.), B., 240.  
sterilisation of, from blue and green mould, (P.), B., 446.  
frozen, juices from, B., 815.  
harvested unripe, formation of anthocyanin in, A., 312.  
soft, desiccation of, (P.), B., 321.  
stored, production of ethyl alcohol and acetaldehyde in, A., 101.  
apparatus for determination of carbon dioxide and oxygen of respiration of, A., 659.  
Fruit extracts, production of, (P.), B., 1007.  
Fruit juices, preparation of, (P.), B., 78.  
action of agar-agar in clarification of, B., 1051.

Fruit juices, drying of, (P.), B., 964.  
concentration of, (P.), B., 447.  
free sulphur dioxide in, B., 46.  
natural and fermented, organic acids of, B., 573.  
determination in, of formic acid, volumetrically, B., 815.  
of lactic and succinic acids, B., 1051.  
Fruit products, quick-freezing of, B., 79.  
Fruit pulp, manufacture of, (P.), B., 447.  
Fruit trees, relation of nitrogen to potassium in nutrition of, B., 362.  
carbinoleum for, B., 908.  
control of Japanese beetle on, B., 955.  
curing silver blight and kindred diseases of, (P.), B., 745.  
deciduous, chlorosis of, due to copper deficiency, B., 907.  
Fuchsia, poisoning of animal stock by, B., 201.  
basic, use of, in plant anatomy, A., 978.  
Fucitol triphenyl methyl ether, A., 42.  
Fucose, A., 723.  
*Fucus vesiculosus*, oxygen consumption by, in fertilisation, A., 82.  
Fuel or Fuels, production of, (P.), B., 328, 457, 921.  
from coal, (P.), B., 1112.  
control of uniformity of, B., 757.  
carbonisation of, (P.), B., 457, 585.  
apparatus for, (P.), B., 1065.  
coking or low-temperature carbonisation of, (P.), B., 873.  
distillation of, low-temperature, (P.), B., 170.  
combustion of, (P.), B., 1017.  
ignition of, in compression-ignition engines, B., 327.  
spontaneous ignition temperatures of, B., 920.  
determination of heating value of, (P.), B., 136.  
net and gross heating values of, B., 166.  
gasification of, (P.), B., 135.  
destructive hydrogenation of, (P.), B., 136.  
oxidation of vapours of, in air, A., 344.  
briquetting of, (P.), B., 170.  
economy of, B., 455.  
characteristics of mixtures of air and, B., 1016.  
use of waste from fibrous plants as, (P.), B., 977.  
utilisation of wood bark as, B., 918.  
determination in, of combustible sulphur, B., 534.  
of moisture, B., 166.  
Fuel or Fuels, artificial, production of, (P.), B., 457.  
carbonised, manufacture of, (P.), B., 1066.  
coal-oil, B., 1014.  
coal gas, B., 6.  
disperse, applications of, B., 1110.  
finely-divided, gasification of, (P.), B., 377.  
fossil, treatment of, before stacking, (P.), B., 633.  
heavy oil, treatment of, (P.), B., 636.  
liquid, B., 968.  
solidification of, (P.), B., 589.  
burners for, (P.), B., 11, 137, 414.  
determination of spontaneous ignition temperatures of, B., 920.  
use of aluminium for containers for, B., 843.  
use of inert gases in tanks for, to prevent fire, (P.), B., 378.  
liquid, gaseous or pulverulent, production of high temperatures by combustion of, (P.), B., 1.

- Fuel or Fuels**, low-grade, gasification of, with oxygen and steam, B., 296.  
 lump, combustion of, A., 577.  
 moist, treatment of, (P.), B., 537.  
 motor, (P.), B., 11, 715, 827, 877, 926, 1019.  
 production of, (P.), B., 92, 539, 710, 1066.  
   from heavier carbonaceous materials, (P.), B., 92.  
   from paraffins, (P.), B., 926.  
   from petroleum oils, (P.), B., 412.  
 knocking properties of, and knock prevention, B., 666.  
 measurement of resistance of, to knocking, B., 376.  
 relation between chemical structure and anti-knock properties of, B., 376.  
 effect of jacket and valve temperatures on knock ratings of, B., 920.  
 cracked, refining of, (P.), B., 92.  
 identifiable, (P.), B., 93.  
 detection and determination of sulphur in, with mercury, B., 921.  
 determination in, of alcohol and benzene, B., 297.  
   of gums, B., 536.  
 oil, (P.), B., 877.  
   heat-insulation of Engler flask in distillation test of, B., 409.  
   anti-knock, preparation of colloidal lead for, (P.), B., 190.  
   Baku, preparation of bright stocks from, B., 825.  
   Grozni mixed-base, heavy cracking of, B., 457.  
   hydrogenation of, B., 456.  
   heavy, properties of, B., 873.  
   Surakhani, refining of, B., 1016.  
   cracking of, B., 456.  
 pulverised, burning of, (P.), B., 414.  
   in locomotive boilers, (P.), B., 292.  
   burners for, (P.), B., 172.  
   ash of, B., 583.  
   treatment of, for use in engines and furnaces, (P.), B., 585.  
 pulverulent, burners for, (P.), B., 1019.  
   withdrawal of, from grinding apparatus, (P.), B., 1019.  
 smokeless, production of, (P.), B., 536, 537.  
   in Great Britain, B., 6.  
 solid, calculation of composition of, from proximate analysis and calorific value, B., 1063.  
   production of, (P.), B., 827.  
   from alcohol, (P.), B., 1066.  
   distillation of, (P.), B., 827.  
   low-temperature distillation of, (P.), B., 633.  
   absorption and retention of hydrocarbons by, B., 216.  
   combustion of, in furnaces with grates, (P.), B., 1017.  
   enrichment of, B., 7.  
   apparatus for destructive hydrogenation of, (P.), B., 247.  
   oxidation of, B., 870.  
   for boilers, B., 534.  
   oven for determination of ash in, B., 487.  
   ash-free, manufacture of, (P.), B., 1017.  
 solid and liquid, thermodynamics of gross and net heating values of, B., 166.  
**Fuel briquettes**. See under *Briquettes*.  
**Fulminating matter**, variation of tension of, A., 358.  
**Fulminic acid**, action of halogens on, A., 605.  
**Fulminic acid**, mercuric salt, preparation of, (P.), B., 290.  
   origin of explosive wave in, A., 127.  
   action of halogens on, A., 257, 605.  
   silver salt, of Berthollet, A., 582.  
**Fumarase**, action and specificity of, A., 192.  
   kinetics of, A., 880, 1286.  
**Fumaric acid**, ferrous salt, A., 42.  
**Fumes**, plant for removal of, in chemical works, B., 1011.  
**Fumigants**, (P.), B., 482, 962.  
**Fumigation**, concentrated, B., 369.  
   using sulphuric acid and sodium cyanide, B., 813.  
**Fungi**, effect of olive oil on nutrition of, A., 1168.  
   lignin-like complexes in, A., 662.  
   decomposition of straw by, A., 93.  
   liberation of hydrogen cyanide by, A., 888.  
   resistance of Japanese wood to, B., 1032.  
   cellulose-decomposing, A., 195.  
   edible, poisons in, A., 965.  
   vitamin content of, A., 309.  
   higher, chemical composition of spores of, A., 314.  
   parasitic, effect of fat-soluble vitamin on growth of, A., 1169.  
   wood, antiseptic action of higher fatty acids against, B., 308.  
**Fungicides**, B., 954; (P.), B., 40, 530, 571, 745.  
   production of, (P.), B., 442.  
   furfuraldehyde derivatives as, B., 363.  
   spray fluids as, B., 39, 857.  
   use of sulphite-pulp waste liquors as, B., 202.  
   volatilisation of sulphur for use as, (P.), B., 422.  
   for peaches, B., 955.  
   for plants, (P.), B., 956.  
   use of dyes for, B., 955.  
   copper, B., 319.  
   sulphur, B., 201, 1097.  
   toxicity of, in relation to pentathionic acid content, B., 523.  
**Furan**, allylic systems in, A., 1255.  
   nucleus, orientation in, A., 619.  
   formation of, from furfuraldehyde, and its pyrolysis and absorption, A., 857.  
   derivatives, A., 519.  
   condensations of, A., 1140.  
   stability of, towards acids, A., 1038.  
   physiological properties of, A., 1163.  
   detection of, by pine-shaving reaction, A., 1270.  
**Furan**, 2-iodo-, A., 399.  
**Furans**,  $\beta$ -substituted, A., 620.  
**Furan series**, aldehyde syntheses in, A., 166, 1259.  
**Furan-3-aldehyde**, and its phenylhydrazone, A., 949.  
**Furan-3-carboxylic acid**, and its derivatives, A., 519.  
**1:12-Furano-2:3-10:11-dibenzoperylene-quinone**, and its derivatives, A., 731.  
**Furan-2:3:5-tricarboxylic acid**, A., 1234.  
**Furazan oxide**, dibromo-, A., 175.  
**Furfuracrylic acid**. See  $\beta$ -Furylacrylic acid.  
**Furfuraldehyde**, formation of, from pentoses, A., 279, 1236.  
   production of, from husks of sunflower seeds and materials containing pentosans, B., 1070.  
   from wood pulp, (P.), B., 973.  
   hydrogenation of, A., 1140.  
   condensation product of, with ammonium trithiocarbonate, A., 68.  
**Furfuraldehyde**, formation of furan from, A., 857.  
   synthetic resin from carbamide and, (P.), B., 737.  
   fungicidal efficiency of derivatives of, B., 363.  
   determination of, as 2:4-dinitrophenylhydrazone, A., 763.  
**3-Furfuraldehyde**. See *Furan-3-aldehyde*.  
**Furfuryl halides**, abnormal reaction of, with potassium cyanide, A., 1255.  
 **$\alpha$ -Furfuryl group**, rearrangement of, A., 858.  
**Furfurylhydantoin**, A., 400.  
**Furfurylideneacetone**, relationship of, with other aldehyde-acetone condensation products, A., 1140.  
**Furfurylidenebisindone**, A., 1252.  
**Furfurylidenebisthiolacetic acid**, A., 1235.  
**Furfurylidenehydantoin**, A., 400.  
**Furfurylidene malonic acid**, ethyl ester, nitration of, and 5-nitro-, A., 1038.  
**Furfurylidene-2-thiohydantoin**, A., 400.  
**Furfuryl-2-thiohydantoin**, A., 400.  
**Furs**, manufacture of, for use in making of fur pile fabrics, (P.), B., 178.  
   carrotting of, (P.), B., 99.  
   destruction of moths and their eggs in, (P.), B., 439.  
**Furnaces**, (P.), B., 1, 83, 211, 243, 451, 452, 579, 628, 707, 1059.  
   construction of, (P.), B., 660.  
   operation of, (P.), B., 1.  
   air preheaters for, (P.), B., 165.  
   arches for, (P.), B., 630.  
   abutments for, (P.), B., 211.  
   burners for, (P.), B., 221.  
   doors for, (P.), B., 87.  
   metallic alloy hearth plates for, (P.), B., 731.  
   linings for, (P.), B., 307.  
   chamotte for, (P.), B., 1032.  
   refractory linings for, (P.), B., 936, 937.  
   refractory structures for, (P.), B., 243, 888.  
   thermostats for safety control of, (P.), B., 459.  
   walls for, (P.), B., 244.  
   walls, arches, etc., for, (P.), B., 1062.  
   device for tilting of, (P.), B., 6.  
   characteristics of, B., 915.  
   operation of, (P.), B., 1011.  
   charging apparatus for, (P.), B., 789.  
   supplying of pulverised coal to burners of, (P.), B., 137.  
   regulation of combustion in, (P.), B., 791.  
   indication of progress of combustion in, (P.), B., 2.  
   combustion of pulverised fuel in, (P.), B., 292.  
   economy of fuel and abating of smoke in, (P.), B., 163.  
   flow of heat in, B., 483.  
   heat balances of, B., 755.  
   heating and supply of air for, (P.), B., 372.  
   cooling of, (P.), B., 371.  
   air-cooled walls for, (P.), B., 484.  
   spray cooling systems for grates of, (P.), B., 213.  
   control of temperature in, (P.), B., 789.  
   device for, (P.), B., 755.  
   utilisation of waste gases from, (P.), B., 165.  
   discharge and heating of metals in, (P.), B., 27.  
   conveyance of goods, etc., through, (P.), B., 131.  
   disposal of fly-ash in, (P.), B., 404.

Furnaces, with grates, combustion of solid fuels in, (P.), B., 1017.  
 for carbonisation, (P.), B., 1017.  
 for ceramics, (P.), B., 343.  
 for drying and roasting, (P.), B., 531.  
 for low-grade fuel, (P.), B., 922, 964.  
 for pulverulent fuels, (P.), B., 755.  
 for supply of hot gases, (P.), B., 163.  
 for ingots, billets, etc., (P.), B., 607.  
 for annealing of plate sheet or strip metals, (P.), B., 110.  
 for heat-treatment of metals, (P.), B., 730, 847.  
 for heating of sheet metals, (P.), B., 112\*.  
 for melting of metals, (P.), B., 349, 893.  
 for reheating of billets, etc., (P.), B., 803.  
 for roasting of ores, (P.), B., 729.  
 for sintering, roasting, and firing, (P.), B., 243.  
 for superheating steam, etc., (P.), B., 292.  
 burning waste materials, etc., (P.), B., 324.

Furnaces, annealing, (P.), B., 110, 307.  
 annealing and carburising, for metals, (P.), B., 730.  
 blast, (P.), B., 607, 893.  
 correlation of data for, B., 264.  
 hoppers for, (P.), B., 558.  
 linings for, B., 1079.  
 changing of tuyères of, (P.), B., 1088.  
 operation of, (P.), B., 511, 607.  
 with peat coke, B., 385.  
 apparatus for charging of, (P.), B., 455.  
 control for charging of, (P.), B., 311.  
 control of, (P.), B., 110.  
 effect of raw materials on coke consumption in, B., 679.  
 Upper Silesian coke for, B., 919.  
 oil in gas flues of, B., 346.  
 smelting in, with screened raw materials, B., 345.  
 charcoal, high-magnesia slags from, B., 889.  
 of the Ford Motor Co. at Dagenham and of the S. African Iron & Steel Industrial Corp. at Pretoria, B., 602.  
 boiler, (P.), B., 133.  
 linings for, (P.), B., 1060.  
 refractories in, B., 306.  
 walls for, (P.), B., 663.  
 utilisation of waste heat from, (P.), B., 2.  
 consuming smoke in, (P.), B., 789.  
 removal of sulphur from gases from, B., 404.  
 coal-fired, (P.), B., 83.  
 combustion double-tube, A., 591.  
 crucible, linings for, (P.), B., 730.  
 cupola, (P.), B., 27.  
 tuyères for, (P.), B., 803.  
 use of anthracite instead of coke in, B., 385.  
 drum, lifter bars, blades, etc., for, (P.), B., 221.  
 electric, B., 352, 610; (P.), B., 432, 731, 732, 775, 897, 1038.  
 carbon electrodes for, (P.), B., 69.  
 heaters for, (P.), B., 28.  
 refractory bricks for roofs of, B., 1031.  
 refractory materials for, B., 24.  
 voltage regulator for, B., 113.  
 resistors for, (P.), B., 992.  
 tubular resistor element for, (P.), B., 113.  
 protection of resistors of, (P.), B., 897.  
 thermostats for, A., 245.  
 heating of, B., 1124.  
 heating of charge in, (P.), B., 732.  
 for continuous heating, B., 513.

Furnaces, electric, melting of materials in, (P.), B., 804.  
 production of cast iron in, B., 848.  
 for enamelling, etc., (P.), B., 732.  
 for melting of glass, (P.), B., 422.  
 for high temperatures, B., 291.  
 for chemical industry, B., 991.  
 for production of iron and steel, B., 938; (P.), B., 513.  
 for treating metals, (P.), B., 802.  
 for heat-treatment and melting of metals, B., 511.  
 for heat-treatment of wires, etc., (P.), B., 943.  
 arc, (P.), B., 433, 775.  
 rectifier for feeding of, with alternating current, (P.), B., 28.  
 annealing, (P.), B., 611.  
 of metals, etc., B., 232, 349.  
 with copper electrodes containing calcium and lithium, A., 820.  
 high-frequency, B., 992.  
 use of gases from, (P.), B., 944.  
 high-temperature, laboratory, A., 137.  
 induction, (P.), B., 113, 352, 513, 611, 732, 943.  
 cooling device for, (P.), B., 944.  
 lining of, with unburnt bricks, B., 841.  
 linings for, (P.), B., 470.  
 laminated iron shells for, (P.), B., 992.  
 control of stirring in, (P.), B., 646.  
 transformer for, B., 803.  
 for heat-treatment of alloys, B., 685.  
 coreless, (P.), B., 944.  
 high-frequency, (P.), B., 28.  
 muffle, automatic control of, (P.), B., 113.  
 multiple-frequency, (P.), B., 558.  
 melting, electrodes for, (P.), B., 1089.  
 resistance, (P.), B., 558, 611, 804, 897.  
 temperature regulator for, B., 731.  
 rocking indirect-arc, uses of, B., 848.  
 smelting, (P.), B., 27.  
 steel, use of Soderberg electrodes in, B., 389.  
 travelling-grate, (P.), B., 611.  
 gas-fired, (P.), B., 531.  
 burners for, (P.), B., 11.  
 gas-heated, (P.), B., 1012.  
 valves for, (P.), B., 915.  
 glass-melting, (P.), B., 182, 422.  
 heat-treatment, (P.), B., 1, 84, 660, 894.  
 for metals, etc., (P.), B., 660.  
 for strips, wires, etc., (P.), B., 371.  
 gas-fired, (P.), B., 84.  
 laboratory continuous, A., 1012.  
 high-temperature, A., 591.  
 liquid-fuel, for pots, etc., (P.), B., 1012.  
 melting, for metals, utilisation of heat from, (P.), B., 266.  
 for mineral wool production, (P.), B., 660.  
 metallurgical, (P.), B., 27, 512.  
 temperature control in, B., 264.  
 heat consumption efficiency of, B., 468.  
 mechanical stokers for, B., 682.  
 zirconium refractory bricks for lining of, B., 64.  
 fuel gas for use in, (P.), B., 1067.  
 normalising, B., 643.  
 muffle, (P.), B., 755, 787, 867.  
 oil-fuel, (P.), B., 83, 131.  
 oil or exhaust gases, (P.), B., 211.  
 open-flame, (P.), B., 607.  
 open-hearth, (P.), B., 607, 942, 1011.  
 design of, B., 755.  
 cooling port structures of, (P.), B., 802.

Furnaces, open-hearth, regenerative chambers for, (P.), B., 789.  
 fired with mixed gas, B., 773.  
 temperatures in, in relation to calorific value of fuel, B., 842.  
 calculation of charge, slag composition and dcooxidation in, B., 842.  
 basic, use of siemensite in, B., 1120.  
 Stevens, B., 65.  
 ore-roasting, (P.), B., 266.  
 puddling, heat consumption of, B., 550.  
 gas and heat distribution in, B., 773.  
 pulverised-fuel, (P.), B., 660.  
 regenerative, (P.), B., 83.  
 control of, (P.), B., 1, 579.  
 refractory bricks and chequer work for, (P.), B., 642.  
 reversing, (P.), B., 211.  
 for glass, etc., (P.), B., 755.  
 protection shields for burners for, (P.), B., 708.  
 retort, (P.), B., 660.  
 vertical, (P.), B., 632.  
 reverberatory, (P.), B., 110, 607.  
 smelting of ores in, (P.), B., 802.  
 regenerative, (P.), B., 83.  
 roasting, (P.), B., 110, 628, 802.  
 cleaning of gases from, (P.), B., 110.  
 rotary, (P.), B., 163.  
 burner for, for melting ores, etc., (P.), B., 487.  
 drum, (P.), B., 211.  
 heat economy in, (P.), B., 292.  
 poppet-valve, (P.), B., 188.  
 rotary-hearth, (P.), B., 83, 244\*.  
 charging of, (P.), B., 610.  
 Siemens-Martin, B., 550.  
 smelting, (P.), B., 110, 607, 942.  
 soaking-pit, (P.), B., 83.  
 stoker-fed, walls for, (P.), B., 1109.  
 tube-still, (P.), B., 531.  
 tunnel, (P.), B., 83.  
 vacuum, for calorimetry, A., 1225.

Furniture, accelerated ageing tests on finishes for, B., 947.

Furocoumarin group, A., 521.

Furo-2:4-diazoles, A., 757.

Furoic acid, 4-nitro-5-amino-, ethyl ester, A., 519.

Furois, detection of, microchemically, A., 632.

Furoyl chloride, B., 300.

Furylacetaldehyde, A., 143.

Furylacetylene, 5-bromo-, A., 63.

$\beta$ -Furylacryloacetic acid, ethyl ester, A., 1259.

$\beta$ -Furylacrylacetone, A., 1259.

Furylacrylic acid, administration of, to rabbits, A., 86.

$\beta$ -Furylacrylic acid, esters of, A., 63.

$\beta$ -Furylacryloyl chloride,  $\beta$ -5-bromo-, and  $\alpha$ -bromo- $\beta$ -5-bromo-, A., 63.

Furylalanine, synthesis of, A., 400.

2-Furyl-di-4-hydroxy-1-naphthylmethane, and its derivatives, A., 145.

2-Furyldimethylcarbinol, A., 1255.

Furylglycidic acid, sodium salt, A., 143.

Furylmalonic acid,  $\alpha$ -cyano- $\beta$ -5-bromo-, ethyl ester, A., 1038.

Furyl methyl ketone, 5-bromo-, and its oxime, A., 63.

2-Furyl methyl ketone, 5-nitro-, and its semicarbazone, A., 519.

$\beta$ -2-Furylpropane- $\gamma$ -tricarboxylic acid, and its triethyl ester, A., 1255.

Furylpropionic acid, 5-bromo-, and its  $\alpha$ -naphthalide, A., 63.

$\gamma$ -2-Furylpropyl chloride, A., 279.

5- $\beta$ -2-Furylvinyltoluene, 2:4-dinitro-, A., 57.

Fuses, blasting and mining, electric, fuse-heads for, (P.), B., 753.  
 high-voltage, (P.), B., 515.  
 safety, for blasting, etc., (P.), B., 705.  
 Fusel oil, fractionation of, B., 655.  
 determination of, in alcoholic liquids, B., 282.  
 in spirits, B., 700.

## G.

Gadolinite, of Ontario, A., 1228.  
 Gadolinium sulphate, magnetic properties of, A., 16.  
*Gadus aeglefinus*. See Haddock.  
 Galactal, and its triacetate, A., 933.  
*d*-Galactonic acid, preparation of, electrolytically, A., 1113.  
 Galactose, spectrum of, A., 1020.  
 action of boric acid and borates on rotatory power of, A., 120.  
 phosphorylation of, A., 544.  
 assimilation of, A., 85.  
 as diet in diabetes, A., 1157.  
 tolerance of, in health and in diabetes, A., 872.  
 oxime, ring-chain isomerism in acetates of, A., 1237.  
 6-phosphate, synthesis and enzymic decomposition of, A., 929.  
 determination of, in blood and urine, A., 183.  
*α*-Galactose oxime hexaacetate, A., 1237.  
*d*-Galactose, oxidation of, A., 369.  
 synthesis of *d*-talose from, A., 933.  
*β*-phenylethylhydrazone, A., 942.  
*d*-Galacturonic acid, preparation of, A., 44.  
 reaction of, with pectin, A., 367.  
*dl*-Galacturonic acid, synthesis of, from mucic acid, A., 367.  
 Galena, crystal cavities and brine content of, A., 1229.  
 Gall-bladder, function of, A., 1155.  
 cholesterol function of, A., 534.  
 Gall-stones, composition of, and their solubility in dog bile, A., 536.  
 formation of, A., 79.  
 colloidal phenomena in, A., 417.  
 deposition of calcium carbonate due to obstruction by, A., 1279.  
 human, cholesterol from, A., 960.  
 Gallic acid, condensation of, with butyl-chloral, A., 848.  
 esters of, A., 382.  
*p*-phenylphenacyl ester, A., 745.  
 Gallium, nuclear moment of, A., 551.  
 isotopes of, A., 439.  
 geochemistry of, A., 595.  
 crystal structure of, A., 797.  
 crystallographic relation of, to aluminium, germanium, and silicon, A., 681.  
 Gallium compounds containing nitrogen, A., 1218.  
 Gallium salts, polarographic studies with, A., 1093.  
 Gallium trifluoride trihydrate, A., 1218.  
 halides, magnetic susceptibility of, A., 985.  
 trihalides, properties of, A., 988.  
 heat of formation of, A., 998.  
 ammonates of, A., 1218.  
 oxides, A., 238.  
 Gallic nitride, A., 1218.  
 Gallium organic compounds:—  
 Gallium triethyl, and its derivatives, A., 258.  
 trimethyl etherate, A., 1120.  
 Gallium determination:—  
 determination of, electrochemically, A., 490.

Gallotannic acid, heterogeneity of, A., 201.  
 Galvanometers, zero-current thermionic valve, A., 1013.  
 Gambier, differentiation of cutch, kino, and, B., 852.  
 Gambir, assay of tinctures of, B., 1136.  
 Gamboe, optical rotation of, B., 117.  
 Garbage, contamination of ground water by impounded waste from, B., 402.  
 Garnet, composition of, A., 493.  
 from Monte Rosso di Verra, A., 1106.  
 in rocks near West Redding, Conn., A., 926.  
 heat-treatment of abrasives containing, (P.), B., 888.  
 cordierite, and gneiss from Burma, A., 1107.  
 Gas, automobile exhaust, effect of, on guinea-pigs, A., 963.  
 coal, production of, (P.), B., 54, 377.  
 in chamber ovens, (P.), B., 921, 922.  
 in horizontal chamber ovens, (P.), B., 489.  
 regenerative chamber ovens for, (P.), B., 667.  
 liquor effluents from, B., 53.  
 solvents from, B., 297.  
 production of coke and, in intermittently operated ovens, (P.), B., 873.  
 purification of, B., 759; (P.), B., 9, 171, 299, 329, 538, 875, 1017, 1067.  
 by cooling, B., 296.  
 in a rotary drum, B., 167.  
 with iron oxide, B., 52.  
 activation of masses used for, (P.), B., 634.  
 treatment of waste liquors from, (P.), B., 829.  
 dry purification of, B., 535, 664.  
 dehydration of, (P.), B., 922.  
 removal of moisture and gasoline from, (P.), B., 171.  
 removal of carbon monoxide from, with bacteria, B., 296.  
 washing of benzol from, B., 215.  
 removal of hydrogen sulphide from, (P.), B., 922.  
 removal of naphthalene from, B., 296, 967.  
 desulphurisation of, by Ges. für Kohlentechnik process, B., 167.  
 plant for, (P.), B., 171.  
 removal of sulphur from ammonium sulphate saturator gases for, B., 168.  
 removal of tar from, (P.), B., 538.  
 drying of, by the Lenze process, B., 488.  
 theory of, B., 215.  
 low-temperature cooling and treatment of, B., 488.  
 calorific value of, in relation to working costs and results, B., 1064.  
 automatic control of, B., 168.  
 burning of, (P.), B., 922.  
 dilution of, with producer gas, B., 168.  
 use of, as fuel, B., 6, 632.  
 gum deposits in distribution systems for, B., 1111.  
 naphthalene in, from horizontal retorts and vertical chamber ovens, B., 967.  
 removal of, by suction from chamber ovens, (P.), B., 971.  
 control of, for distant supply, B., 631.  
 reduction of toxicity of, by bacteria, B., 488.  
 400 B.Th.U., manufacture and supply of, B., 583.  
 town, products liquefied from, by cooling to  $-20^{\circ}\text{C}$ , B., 214.  
 removal of carbon dioxide and hydrogen sulphide from, B., 214.

Gas, coal, analysis of, B., 759.  
 determination in, of hydrocyanic acid, B., 824.  
 of hydrogen and methane, B., 53.  
 of nitrogen, apparatus for, B., 488.  
 coal and water-, production of, (P.), B., 329.  
 coke-oven, recovery and purification of, (P.), B., 761.  
 purification of, (P.), B., 537.  
 influence of electric discharge on, B., 664.  
 decomposition of, by compression and cooling, (P.), B., 89.  
 nitric oxide in, B., 488.  
 production of ammonia and methyl alcohol from, (P.), B., 329.  
 utilisation of, B., 1015.  
 in manufacture of iron and steel, B., 758.  
 in iron-smelting furnaces, B., 488.  
 in steel works, B., 1014.  
 combustible, production of, (P.), B., 9, 634, 970, 1066.  
 by the butane-air process, B., 6.  
 from liquid fuel, (P.), B., 668.  
 apparatus for, (P.), B., 791.  
 treatment of, (P.), B., 89.  
 rich in hydrogen, production of, (P.), B., 298.  
 fuel, production of, (P.), B., 761, 874.  
 from wood waste, B., 1064.  
 purification of, (P.), B., 537.  
 apparatus for cleaning of, (P.), B., 89.  
 drying and purification of, (P.), B., 377.  
 dehydration of, (P.), B., 922.  
 recovery of ammonia from, B., 1015.  
 removal of hydrogen sulphide from, (P.), B., 791, 875.  
 removal of naphthalene, etc., from, (P.), B., 165.  
 removal of naphthalene and gum-forming constituents from, (P.), B., 791.  
 removal of naphthalene and tar from, (P.), B., 668.  
 effect of rate of mixing of air and, on its combustion in flues and furnaces, B., 326.  
 use of, in metallurgy, (P.), B., 1067.  
 non-poisonous, production of, (P.), B., 377.  
 analysis of, B., 246.  
 of high calorific value, production of, by gasification with oxygen, (P.), B., 248.  
 natural, separation and utilisation of constituents of, (P.), B., 491.  
 conversion of, (P.), B., 89.  
 into water gas, etc., (P.), B., 1018.  
 odorising of, B., 488.  
 from the Apscheron peninsula, B., 376.  
 Italian, A., 247, 926.  
 from Maikop, Grozni, Baku, and Dagستانские Ogni, B., 1016.  
 Polish, A., 1106.  
 Russian, A., 594.  
 from Turner Valley, Alberta, B., 584.  
 oil, manufacture of, (P.), B., 89, 410, 762, 1066.  
 mixed oil- and water-, manufacture of, (P.), B., 828.  
 power and fuel, from distillery wastes, B., 326.  
 producer, manufacture of, B., 1015; (P.), B., 298, 874.  
 with simultaneous cracking of hydrocarbon oils, (P.), B., 410.  
 purification of, (P.), B., 712.  
 removal of sulphur from, (P.), B., 458.  
 determination in, of water, B., 326.



**Gas, town, purification of, with iron oxide,** B., 296.  
 production of ammonia and methyl alcohol from, (P.), B., 329.  
 use of, in pottery industry, B., 799.  
 in tinplate works, B., 583.  
 economic advantages of, as a fuel, B., 375.  
 non-poisonous, production of, (P.), B., 298, 377.  
**water, equilibrium of formation of, A.,** 467, 695, 808.  
 manufacture of, (P.), B., 171, 248, 328, 377, 633, 761, 762, 922, 1113.  
 from low-grade anthracite, (P.), B., 761.  
 from carbohydrates, B., 1015.  
 from dry-quenched coke, B., 296.  
 from coke and coal, B., 1111.  
 continuously, from powdered fuels, B., 6.  
 apparatus for, (P.), B., 762.  
 automatic control apparatus for, (P.), B., 378.  
 Pintsch-Hillebrand apparatus for, at Hamburg Gasworks, B., 789.  
 in vertical chamber ovens, (P.), B., 170.  
 removal of dust from plant for, (P.), B., 299.  
 with simultaneous cracking of hydrocarbon oils, (P.), B., 410.  
 generators for, (P.), B., 490.  
 sulphur compounds in, and their removal, B., 215.  
 enriching of, (P.), B., 89.  
 blue, manufacture of, from bituminous fuels, (P.), B., 634.  
 carburetted, manufacture of, (P.), B., 410, 458, 537, 667, 761, 922, 1066.  
 apparatus for, (P.), B., 586.  
 use of coal-tar creosote in, B., 53.  
 determination in, of water, B., 326.  
**Gases, purification of, (P.), B., 458, 537, 538.**  
 centrifugal apparatus for, (P.), B., 756, 822.  
 revivification of potassium ferrocyanide used in, (P.), B., 341.  
 electrical purification of, B., 943; (P.), B., 898.  
 apparatus for, (P.), B., 515.  
 self-cleaning electrodes for, (P.), B., 1039.  
 cleaning of, (P.), B., 1012.  
 apparatus for, (P.), B., 373.  
 centrifugal apparatus for, (P.), B., 868.  
 cleaner for, (P.), B., 581.  
 washing of, B., 1.  
 apparatus for, (P.), B., 213.  
 separation of solids from, (P.), B., 1013.  
 removal of solid particles from, (P.), B., 325, 407, 581.  
 apparatus for, A., 925.  
 filters for, (P.), B., 293, 454, 630, 821, 868.  
 rotatable filters for, (P.), B., 663.  
 filters with travelling elements for, (P.), B., 581.  
 electro-filters for separation of suspended particles from, B., 531.  
 removal of dusts, etc., from, (P.), B., 407, 756, 1062.  
 by washing, (P.), B., 5.  
 apparatus for, (P.), B., 87, 293, 1062.  
 electrical apparatus for, (P.), B., 515, 646, 804.  
 containing tars, (P.), B., 538.  
 apparatus for electrical treatment of, (P.), B., 1039.  
 electrostatic precipitation apparatus for, B., 28.

**Gases, rod-curtain electrical precipitator for, (P.), B., 1089.**  
 apparatus for separation of suspended materials from, (P.), B., 1109.  
 centrifugal separation of suspended particles from, (P.), B., 293.  
 electrical apparatus for detection of suspended matter in, (P.), B., 515.  
 electrical precipitation of suspended particles from, (P.), B., 115, 192, 268, 433.  
 apparatus for, (P.), B., 353.  
 electrodes for, (P.), B., 732.  
 separation of liquids from, (P.), B., 581, 822.  
 apparatus for, (P.), B., 87.  
 separation of finely-divided liquids from, (P.), B., 51, 663.  
 apparatus for, (P.), B., 756.  
 apparatus for removal of suspended solids and liquids from, (P.), B., 1062.  
 removal of acetylene and acetylenic hydrocarbons from, (P.), B., 55.  
 separation of ammonia from, (P.), B., 329.  
 removal of ammonia and hydrogen sulphide from, (P.), B., 248, 377, 922.  
 removal of carbon monoxide and diolefines from, (P.), B., 9.  
 removal of condensable gases from, (P.), B., 663.  
 removal of hydrogen sulphide from, (P.), B., 9, 171, 491, 828.  
 removal of mists from, (P.), B., 1109.  
 removal of naphthalene from, (P.), B., 377.  
 removal of smoke particles from, (P.), B., 667.  
 removal of sulphur from, B., 375; (P.), B., 136, 341, 586, 1018.  
 removal of sulphur dioxide from, (P.), B., 325, 1029.  
 treatment of, in a high-tension electric field, (P.), B., 898.  
 with atomised liquids, (P.), B., 454.  
 with finely-divided materials, (P.), B., 581.  
 with finely-divided ores, etc., (P.), B., 3.  
 drying of, (P.), B., 87.  
 drying apparatus for, (P.), B., 663, 917.  
 dryers and dust extractors for, (P.), B., 165.  
 heating of, (P.), B., 917.  
 apparatus for heating or cooling of, (P.), B., 87.  
 heat exchangers for cooling of, (P.), B., 372.  
 conditioning of, (P.), B., 455.  
 control of humidity of, (P.), B., 582.  
 measurement of flow of, B., 451.  
 with an orifice meter, B., 963.  
 measurement of slow flow of, A., 246.  
 control of flow of, into vacuum systems, A., 37.  
 contact apparatus for, (P.), B., 165, 663.  
 contact apparatus for liquids and, B., 707; (P.), B., 164, 293, 454, 789.  
 contact apparatus for solids and, (P.), B., 581.  
 contact apparatus for finely-divided solids and, (P.), B., 325.  
 apparatus for mixing of, (P.), B., 756.  
 of different density, automatic control of mixture of, (P.), B., 5.  
 mixing of liquids and, (P.), B., 87.  
 apparatus for, (P.), B., 325.  
 fluctuations in rising mixtures of liquids and, B., 324.  
 atomic diffraction of, A., 1073.

**Gases, spectra of discharges in, A., 439.**  
 ultra-violet discharge lines in, A., 1.  
 Raman effect in, A., 108, 675.  
 light absorption, Raman effect, and motion of electrons in, A., 559.  
 absorption of soft X-rays in, A., 113.  
 scattering of X-rays by, A., 892.  
 electric discharge in, at low pressure, A., 1072.  
 high-frequency discharge in, A., 315.  
 depolarisation in, A., 898.  
 scattering of electrons in, A., 317, 1185.  
 scattering of slow electrons by, A., 442.  
 collisions of slow electrons in, A., 670.  
 collisional friction of electrons in, A., 554.  
 ionisation in, A., 553.  
 by electron impact, A., 321.  
 pure, mobility of ions in, A., 789.  
 motion of positive ions through, A., 4.  
 recombination of ions in, A., 554.  
 collisions of molecules of, with walls, A., 316.  
 effect of electric fields on thermal conductivity of, A., 13.  
 effect of electric and magnetic fields on thermal conductivity of, A., 328.  
 specific heat of, at high temperatures, A., 115, 799, 905, 888.  
 at high pressures, A., 220.  
 determination of ratio of specific heats of, by Kundt's tube, A., 219.  
 heat of expansion of, A., 454.  
 liquefied, solubility in, A., 990.  
 conversion of, into gases, (P.), B., 789.  
 containers for, (P.), B., 789.  
 vessels for storage of, (P.), B., 87.  
 solidified, light from, A., 557.  
 production and maintenance of constant pressures of, in distillation apparatus, etc., (P.), B., 1109.  
 apparatus for compression of, (P.), B., 757.  
 compressors for, (P.), B., 789.  
 determination of density of, A., 1226.  
 apparatus for indicating density of, (P.), B., 1109.  
 viscosity of, A., 685.  
 at high pressures, A., 116.  
 adsorption of, A., 118, 331, 568, 688.  
 theories of, A., 687.  
 by copper, A., 689.  
 by glass, A., 1084.  
 by electrolytic iron, A., 458.  
 by silica gel, A., 690.  
 by solids, A., 331; (P.), B., 663.  
 on wood charcoal, A., 223.  
 by zeolites, A., 458.  
 fabrics for, (P.), B., 16.  
 liquid stationary films in batch absorption of, A., 819.  
 velocity of adsorption of, by porous solids, A., 908.  
 adsorption and solution of, by metals, A., 569.  
 diffusion of, under pressure, A., 224.  
 through membranes, A., 804.  
 solubility and coefficient of dilatation of, A., 222.  
 dispersion of, in liquids, A., 1085.  
 demonstration of Brownian movement in, A., 1105.  
 retardation of mobility of films of, A., 688.  
 equilibria of, A., 808.  
 with solids, A., 16, 697.  
 equations of energy and entropy of, A., 116.  
 determination of intrinsic energy of, A., 1206.  
 energy exchange between atoms of, and solids, A., 316, 680.

Gases, rise of pressure in combustion of, with oxygen, A., 344.  
 theory of pressure impulse in, and detonation waves, B., 705.  
 explosions of, A., 1001.  
   kinetics of, A., 701.  
 tower for reactions of, with liquids, A., 491.  
 cap for tower for bubbling of, through liquids, (P.), B., 164.  
 reactions of, with solids, A., 128, 234, 817, 1003, 1095.  
 carburettling of, under pressure, (P.), B., 1066.  
 effect of pressure on liberation of, from metals, A., 1090.  
 fabrics impervious to, (P.), B., 18, 224, 335, 675, 722.  
 seals for, (P.), B., 133.  
 nomogram for reduction of volumes of, to 30 in. pressure and 60° F., B., 243.  
 recording gravimeter for, (P.), B., 582.  
 removal of, from autoclaves, digestors, etc., (P.), B., 630.  
 sampling of, A., 246.  
   automatic apparatus for, (P.), B., 165.  
 calculation of calorific values from analyses of, B., 584.  
 analysis of, in metals, A., 1010.  
 determination of, in liquids, (P.), B., 213.  
 determination in, of condensable vapours, (P.), B., 1113.  
   of total sulphur, B., 246.  
   of water, B., 326.  
 Gases, acid, separation of, from mixed gases, (P.), B., 887.  
*monatomic*, positive columns in, A., 440, 551.  
   scattering of X-rays by, A., 113.  
   electric and diamagnetic susceptibilities of, A., 1191.  
*diatomic*, positive column in, A., 552.  
   specific heats of, A., 219, 328.  
*polyatomic*, scattering of X-rays by, A., 441.  
 blast-furnace, apparatus for cleaning of, (P.), B., 1062.  
   cooling and washing of, prior to electrical purification, (P.), B., 213.  
   plant for purification of, B., 187.  
   electrostatic purification of, B., 802.  
   wet-purification of, B., 824.  
   generation of steam by, B., 1011.  
 blast-furnace, producer, and coke-oven, combustion of, B., 967.  
 boiler-furnace, removal of sulphur compounds from, B., 404.  
 combustible, low-temperature purification of, for distant supply, (P.), B., 248.  
   prevention of formation of hydrogen sulphide in, during removal of benzol therefrom, (P.), B., 587.  
   oxidation and inflammation of, A., 232.  
   detection of, (P.), B., 491.  
   determination of, B., 375.  
 compressed, apparatus for dehydration and purification of, (P.), B., 533.  
   heat exchanger for cooling of, (P.), B., 452.  
   physical properties of, A., 220, 799.  
   light cylinders for, B., 1036.  
   circulatory pumps for, at 1000 atm., B., 915.  
   electrical breakdown experiments with, A., 983.  
 corrosive, handling of, B., 324.  
 degenerate, transport phenomena in, A., 321.  
 electrically excited, anomalous dispersion in, A., 1.

Gases, explosive, production of, (P.), B., 868.  
 flue, cleaning of, (P.), B., 133.  
 washing of, (P.), B., 87, 868.  
 washing and purification of, (P.), B., 133.  
 removal of dust from, B., 915; (P.), B., 486.  
 removal of dust and sulphur compounds from, (P.), B., 823.  
 separation of solid particles from, (P.), B., 213.  
 automatic recorder for sulphur acids in, B., 323.  
 manufacture of sulphuric acid from, (P.), B., 339.  
 determination in, of combustible gases, (P.), B., 634.  
 furnace, washing of, (P.), B., 630.  
   waste, apparatus for separation of dust from, (P.), B., 87.  
   utilisation of, (P.), B., 165.  
 hot, cooling of, in mains, B., 83.  
 furnaces for supply of, (P.), B., 163.  
 industrial, waste, wet purification of, (P.), B., 5.  
 inert, spectra of, A., 667.  
   scattering of electrons in, A., 1185.  
   electron temperatures in, A., 105.  
   excitation and ionisation of, A., 893.  
   ionisation of, by alkali ions, A., 4, 105.  
   auto-ionisation in, A., 103.  
   superconductivity in, A., 1072.  
   thermal conductivity of, A., 13, 115.  
   energy exchanges between solids and, A., 319, 1074.  
   van der Waals equation for, A., 220.  
   determination of nitrogen in, by molten lithium, A., 1221.  
 ionised, properties of, in high-frequency fields, A., 669.  
   in a magnetic field, A., 209, 554.  
   oscillations of, A., 672.  
   retardation of electric waves in, A., 214.  
 partly-ionised, absorption of Debye-Falkenhagen relaxation power in, A., 1074.  
 irritant, shell for, (P.), B., 1105.  
 low-pressure, radiometric forces in, A., 902.  
 containing methane hydrocarbons, catalytic chlorination and bromination of, A., 347.  
 mineral Polish, sulphur content of, A., 38.  
 mixed, separation of liquefiable constituents from, (P.), B., 165.  
   separation of substances with high vapour pressure at their melting point from, (P.), B., 171.  
   fractionation and condensation of, (P.), B., 87.  
   volumes and temperatures of, B., 403.  
   viscosity, heat conductivity, and diffusion in, A., 14.  
   determination of viscosity of, B., 915.  
   separation of, (P.), B., 293, 406, 629.  
   defrosting of apparatus for, (P.), B., 629.  
   by liquefaction, (P.), B., 917.  
   by refrigeration, (P.), B., 133.  
   quantitative spectroscopic analysis of, A., 353.  
 molecular, absorption of X-rays in, A., 892.

Gases, rare, purification of, by means of decomposition products of glass, (P.), B., 114.  
 positive column in, A., 551.  
 determination of mobility of ions of, A., 4.  
 quantum correction for equation of state of, A., 328.  
 halogen compounds of, A., 1007.  
 rarefied, molecular rotation of, A., 668.  
 flow of, A., 989.  
 real, sound velocity in reactive mixtures of, A., 683.  
 roaster, analysis of, B., 381.  
 unipolar charged, electrical diffusion of ions in, A., 670.  
 van der Waals', colloidal theory of, A., 120.  
 waste carbonaceous, determination of, in air, A., 926.  
 Gas absorption apparatus, A., 1227.  
   micro-, A., 1221.  
   pipette, A., 593.  
   bromine water, for determination of olefines, A., 1226.  
 Gas analysis, corrections in, A., 241.  
   reaction velocities towards oxygen of absorbents used in, B., 641.  
   nomograph for, A., 247.  
   slow-combustion pipette for, A., 138.  
   by condensation and adsorption in silica-gel, B., 7.  
   by heat conductivity methods, B., 915.  
   manometric, A., 488, 530.  
   micro-chemical, A., 291, 1182.  
 Gas analysis apparatus, A., 550, 714, 828; (P.), B., 5, 213, 630.  
   mercury pumps for, A., 138.  
   for small samples, B., 211.  
   electrical, (P.), B., 734.  
   katharometer, thermal conductivity cells for, (P.), B., 1039.  
   portable, A., 246; B., 211.  
 Gas appliances, combustion products of, B., 52.  
   combustion standards of, B., 52.  
 Gas burettes, A., 353.  
 baro-, A., 1226.  
 constant-volume, compensator for, A., 246.  
 Gas burners, (P.), B., 172, 414, 877, 972, 1019.  
   design of, B., 825.  
   control of, (P.), B., 1069.  
   radiating, (P.), B., 831.  
 Gas circulating pump, A., 925.  
 Gas constants, absolute, equivalence of molecular volumes and, A., 14.  
 Gas fires, (P.), B., 972.  
   domestic, liquid-heating apparatus for, (P.), B., 636.  
 Gas generators, (P.), B., 248, 586, 1017.  
 Gas holders, sealing fluid for, (P.), B., 9.  
   to deliver definite volumes of dry gas, A., 138.  
   water-seal, prevention of rusting of iron of, (P.), B., 406.  
 Gas mains, internal corrosion of, B., 297.  
   tetralin process for prevention of naphthalene deposits in, B., 967.  
 Gas masks, (P.), B., 914.  
   manufacture of, (P.), B., 242.  
   filters for, (P.), B., 818.  
   smoke filters for, (P.), B., 823.  
   manufacture of filter insertions for, (P.), B., 130.  
   capacity of drying agents for, B., 865.  
   adsorption of phosgene and chlorine by, B., 706.  
   behaviour of charcoal in, towards phosgene and chlorine, B., 1010.

Gas meters. (P.), B., 165.  
 action of constituents of coal gas on, B., 759.  
 influence of hydrocarbons on leather in, B., 375.  
 Gas oil, carburetted values of, B., 456.  
 oxidation products of, by Penniman process, B., 7.  
 Gas plant, dip pipes for, (P.), B., 636.  
 Gas producers, (P.), B., 8, 9, 410, 458, 537, 586, 711, 828, 1113.  
 use of low-temperature coke in, B., 295.  
 gas composition and heat balance in, B., 919.  
 portable, (P.), B., 55.  
 power, operation of, B., 759.  
 Gas pumps, electromagnetic, A., 246.  
 Gas purification apparatus, (P.), B., 165, 537, 586, 630.  
 electrical, (P.), B., 433.  
 production of high-tension currents in, (P.), B., 646.  
 Gas reactions, apparatus for study of, by actinometry, A., 1013.  
 carrying-out of, with electric glow discharge, (P.), B., 775.  
 acceleration of, (P.), B., 868.  
 binary, heterogeneous catalysis of, A., 579, 819.  
 biological, A., 428.  
 catalytic, (P.), B., 213, 1113.  
 control of temperature of, (P.), B., 868.  
 endothermic, apparatus for, at high temperatures, (P.), B., 328.  
 exothermic, (P.), B., 404, 1061.  
 under pressure, (P.), B., 1061.  
 catalytic, (P.), B., 799.  
 heterogeneous, kinetics of, A., 815.  
 homogeneous, catalysis of, A., 917.  
 first order, A., 232, 702, 1094.  
 Gas retorts. See Retorts, gas.  
 Gas scrubbers, (P.), B., 299, 407, 533, 586, 869.  
 compressed air, (P.), B., 487.  
 Gas stoves, artificial fuel for, (P.), B., 1070.  
 Gas tar. See under Tar.  
 Gas wash bottles, A., 1226.  
 Gas washers, (P.), B., 373, 487, 533, 581, 1062.  
 for removal of naphthalene, action of tetralin on rubber packing in, B., 519.  
 Gas works, in 1931, B., 758.  
 co-ordination of power in, B., 632.  
 use of small coke in, B., 487.  
 complete gasification in, B., 535.  
 composition and treatment of liquor from, B., 706.  
 concentration and utilisation of liquors from, B., 1064.  
 application of Haber-Löwe gas interferometer in, B., 918.  
 Gasoline, production of, from gaseous and low-boiling liquid hydrocarbons, (P.), B., 1069.  
 from high-boiling hydrocarbon oils, (P.), B., 634.  
 from petroleum oils, (P.), B., 412.  
 apparatus for, (P.), B., 971.  
 extraction of, by adsorption, B., 873.  
 by the active carbon process, B., 409.  
 from natural gas, (P.), B., 926.  
 recovery of, from gases, (P.), B., 89, 249.  
 from natural gas, (P.), B., 1069.  
 refining of, B., 872.  
 filter for, (P.), B., 917.  
 treatment of, with zinc chloride by modified Lachman's method, B., 969.  
 cracking of, to give increased octane value, B., 872.  
 production of olefines in, B., 826.

Gasoline, corrosion of cracking plant for, B., 455.  
 stabilisation, rectification, and fractional distillation of, (P.), B., 91.  
 influence of gasoline content of crude oil on yield of, on distillation, B., 455.  
 fractionating columns for complex mixtures of, B., 584.  
 rectification of, B., 873.  
 design of rectifying columns for, B., 584.  
 thermal expansion of, from 0° to 30°, B., 297.  
 condensation of vapours of, (P.), B., 217.  
 miscibility of alcohol and, B., 7.  
 anti-knock characteristics of, B., 872.  
 influence of lead tetraethyl on knock rating of, B., 790, 791.  
 gum stability of, B., 584.  
 peroxides and gum in, B., 7.  
 colouring of, (P.), B., 589.  
 reagent for sweetening of, (P.), B., 92.  
 action of sulphuric acid on fractions of, B., 456.  
 aviation, solubility of water in, B., 53.  
 casing-head, corrosion test on, B., 247.  
 cracked, composition of, B., 456.  
 refining of, B., 169.  
 with aluminium chloride, B., 666.  
 from Grozni, B., 710.  
 distribution of groups of hydrocarbons in, B., 456.  
 mercury and thiocyanate numbers of, B., 969.  
 identification of diolefines in, B., 247.  
 determination in, of unsaturated compounds, B., 968.  
 highly-cracked, B., 826.  
 ethyl, determination of lead tetraethyl in, B., 247.  
 Japanese, B., 375.  
 low-knocking, preparation of, B., 969.  
 Pennsylvanian, fractionation of, B., 584.  
 straight-run, B., 826.  
 determination in, of gum, B., 1065.  
 See also Petrol.  
 Gastric juice, composition of, A., 78.  
 secretion of, A., 534, 1055.  
 effect of amino-acid hydrochlorides on, A., 185.  
 relation of blood-chlorine to, A., 1275.  
 relation of blood-sugar to, A., 958.  
 acidity of, A., 639.  
 from youth to age, A., 534.  
 effect of bromides on, A., 1275.  
 erosion of metals by, A., 535.  
 mucoprotein in, A., 639.  
 partition of nitrogen of, after histamine stimulation, A., 960.  
 potassium and sodium in, after histamine injection, A., 78.  
 determination in, of thiocyanates, A., 185.  
 Gauges, McLeod, calibration of, A., 925.  
 pressure, illuminators for, (P.), B., 407.  
 Gedrite, from N. Carolina, A., 1228.  
 Gels, A., 123, 572.  
 liquors for treatment of substances to obtain, (P.), B., 1029.  
 diffusion of salts through, A., 804.  
 rhythmic phenomena in, A., 571.  
 peptisation of, by electrolytes, A., 466.  
 ultrasonic thixotropy of, A., 693.  
 elastic and non-elastic, free and bound water in, A., 466.  
 inorganic, influence of temperature on, A., 995.  
 bound water in, A., 994.  
 plural, preparation of, (P.), B., 465.  
 Gelatin, structure of, A., 466.  
 combining weight of, as an acid, A., 467.  
 hardening of, (P.), B., 690.

Gelatin, moulding of, (P.), B., 853.  
 storage and examination of, B., 853.  
 opacity in, B., 360.  
 light-sensitive surface layers of, A., 909.  
 action of electric field on, A., 226.  
 isoelectric point of, A., 571.  
 thermal behaviour of, B., 1001.  
 adsorption of, by collodion membranes, A., 691.  
 absorption of water by, A., 20, 226.  
 hydration of, A., 466.  
 diffusion of Liesegang reagents in, A., 467.  
 solution of, in liquids, A., 19.  
 sol-gel transformation in, A., 20, 1088.  
 swelling of, A., 807.  
 effect of swelling on X-ray spectrum of, A., 694.  
 effect of surface-active substances on, A., 337.  
 coacervation in systems containing, A., 571.  
 coacervation of chondroitin-sulphuric acid and, A., 466.  
 coacervation of mixtures of gum arabic sols and, A., 337.  
 protective effect of, on nuclear silver sols, A., 693.  
 heat-coagulable protein in, A., 466.  
 characterisation of, A., 71.  
 food products from, (P.), B., 816.  
 films, cutting of, (P.), B., 98.  
 gels, structure of, A., 466.  
 electrokinetic potential of, A., 21.  
 heat capacity of, A., 1087.  
 freezing of, A., 694.  
 freezing of water in, B., 1005.  
 changes in volume and elastic modulus of, A., 995.  
 diffusion velocity in, A., 1088.  
 diffusion of hydroxyl in, A., 807, 910.  
 absorption of organic liquids by, with-out volume change, A., 20.  
 testing of, B., 439.  
 determination of strength of, B., 853.  
 gels and sols, structure of, A., 995.  
 X-ray spectra of, A., 123.  
 rôle of water in, A., 466.  
 sols, viscosity of, in relation to ash content, A., 465.  
 in relation to concentration, A., 467.  
 structure viscosity of, A., 995.  
 solutions, viscosity of, A., 806.  
 osmotic pressure and micellar weight of, A., 807, 995.  
 changes in, with time, A., 466.  
 determination of  $p_{H_2}$  in, A., 700.  
 surfaces, action of pancreatin on, A., 1064.  
 deaminised, as emulsifying agents, B., 439.  
 dichromated, sensitisation of, B., 865.  
 isoelectric, action of neutral salts on, A., 1088.  
 isoelectric and pure, non-identity of, A., 410.  
 analysis of, B., 1001.  
 detection of, in dairy products, B., 1102.  
 Gelatinase, influence of medium on production of, A., 652.  
 Gelatinates ions, mobility of, A., 470.  
 Gelatinisation, modified, A., 995.  
 Gelatinised substances, constitution and properties of, A., 226.  
 Gelsemium, Chinese. See *Gelsemium elegans*.  
*Gelsemium elegans*, alkaloids of, A., 101.  
 Gentian-violet, differentiation of, used as chromosome stain, A., 314.

- Gentiobiose**, formation of, from glucose and maize starch, A., 500.  
alkaline degradation of, A., 148.
- Geochemistry and radioactivity**, A., 1230.
- cycloGeraniol naphthylurethane**, A., 856.
- Geranium oil**, Réunion, *l*-isomenthone in, B., 656.
- Germanium**, A., 584, 1099.  
occurrence of, in coal, A., 39.  
in Brazilian meteorites, A., 830.  
recovery of, from ores, etc., (P.), B., 990.  
isotopes of, A., 673.  
crystallographic relation of, to aluminium, gallium, and silicon, A., 681.  
equilibrium of, with ammonia, germanic nitride, and hydrogen, A., 1205.  
analogies of, with carbon, A., 901.  
with lead, A., 181.  
heteropoly-acids of, A., 823.
- Germanium compounds**, A., 680.  
with nitrogen, A., 1205.
- Germanium tetrabromide and tetraiodide**, A., 483.  
*tetrachloride*, removal of related chlorides from, with hydrochloric acid, A., 1008.  
hydride, catalytic decomposition of, A., 1213.  
*tetraiodide*, action of ammonia and amines on, A., 132.  
*dioxide*, A., 117.  
conductivity of solutions of, A., 998.  
heat of formation of, A., 998.  
polymorphism of, A., 905.  
rutile form of, A., 681.  
gels, H., 483.
- Germanic nitride**, dissociation of, A., 1205.  
equilibrium of, with ammonia, germanium, and hydrogen, A., 1205.
- Germanous sulphide**, absorption band spectra of, A., 673.  
crystal structure of, A., 903.
- Germanic acid**, dissociation constant of, A., 998.
- Germanates**, A., 584.
- Tungstogermanic acids**, A., 351.
- Germanium organic compounds**, A., 629, 866.  
aliphatic, A., 606.  
optically active, A., 291, 409.  
**Germanium tetra-2-thienyl**, A., 762.
- Germanium determination and separation** :—  
determination of, gravimetrically, A., 244.  
separation of, from arsenic, A., 356.
- Germicides**, (P.), B., 202.  
preservation of biological products with, B., 290.  
gas for use as, (P.), B., 370.  
irradiated oils as, B., 1138.  
efficiency of mixtures of phenols and sodium hydroxide as, B., 130.
- Germination**, biocatalysts in, A., 887.
- Geyers**, spray-type, (P.), B., 407.
- Ghee**, vitamin-A content of, A., 433.
- Gidgea**, poisoning of animal stock by, B., 201.
- Gilsonite**, soluble, manufacture of, (P.), B., 21.  
substitute for, in varnishes, B., 996.
- Ginkgo biloba**, constituents of leaves of, A., 1138.
- Ginnol**, and its acetate, A., 1138.
- Ginnone**, and its oxime, A., 1138.
- Ginseng**, Chosen, inorganic salts in, A., 1177.  
influence of, on glycuronic acid in urine, and on glutathione in tissues, A., 1163.  
red and white, sugars and pentosans in, A., 1177.
- Gismondite**, crystal symmetry of, A., 450.
- Gizzard**, hen's, amylase in, A., 1274.
- Gladiolus** corins, flower production from, in relation to period of harvesting, B., 954.  
ethylene chlorohydrin treatment of, A., 889.
- Glands**, physiology of, A., 535, 1068, 1171.  
endocrine, influence of, on sugar excretion, A., 656.  
lymph, proteases in, A., 91.  
effect of extracts of, on growth, A., 1171.  
of cattle, lipins of, A., 959.  
See also Mammary glands, Pituitary, Thyroid, and Thymus.
- Glass**, constitution of, A., 696.  
formation and state of, A., 325, 800.  
manufacture of, (P.), B., 936.  
from blast-furnace slag, B., 181.  
use of electrochemical by-products in, B., 841.  
using sodium silicate, B., 262.  
apparatus for, (P.), B., 888.  
specific gravity of sodium carbonate used in, B., 641.  
gathering pot for furnaces for, (P.), B., 467.  
refining of, (P.), B., 24.  
with calcium fluoride, B., 936.  
thermal treatment of, B., 383.  
determination of annealing constants of, B., 104.  
electric annealing of, B., 887.  
circulation of, in glass-furnaces, (P.), B., 263.  
coloration of, A., 557; (P.), B., 182.  
yellowing of, B., 770.  
decolorisation of, B., 22.  
with cerium, B., 466.  
decolorisation and colouring of, with pyrolusite, B., 307.  
etching of, B., 104, 1030.  
flow of, in tank furnaces, B., 63.  
in tanks, B., 799.  
layering of, on solidification, B., 422.  
melting of, B., 466.  
chamotte for crucibles for, (P.), B., 1032.  
clay mixtures for pots for, B., 982.  
furnaces for, (P.), B., 422.  
electric furnaces for, (P.), B., 422.  
tank furnace for, (P.), B., 466.  
preheater and mixer for, (P.), B., 467.  
regeneration in, B., 725.  
reversible regenerative furnaces for, (P.), B., 708, 755.  
electric melting tanks for, (P.), B., 1032.  
resistance to corrosion of melting pots for, B., 771.  
homogenisation of melts of, A., 911.  
felts for polishing of, (P.), B., 423, 936.  
strengthening of, (P.), B., 983.  
tempering of, (P.), B., 64, 888.  
plastic distortion of, B., 230.  
determination of breaking strength of fibres of, B., 531.  
tensile strength of, B., 982.  
transverse strength of, B., 305.  
relation between physical properties and composition of, B., 771.  
formulae for refractive indices of, B., 181.  
light-source for measurement of absorption of, in the blue and ultra-violet, B., 342.  
absorption spectra of, measured with thorium and Uviol lamps, A., 673.  
red fluorescence of, A., 213.  
photographic latent images on, B., 449.  
absorption of X-rays by, B., 1079.
- Glass**, luminescence of, A., 793.  
ionic conductivity of, A., 230, 447.  
dilatation and birefringence of, A., 900.  
"moisture expansion" of, B., 466.  
volumes of technical varieties of, A., 322.  
molten, metal nozzles, etc., for discharging of, (P.), B., 936.  
apparatus for collection, delivery, etc., of, (P.), B., 24.  
viscosity of, B., 342, 725.  
molten and plastic, viscosity-temperature relationship and nature of, B., 982.  
specific gravity of, in relation to its composition, B., 770.  
viscosity of, near its annealing point, B., 887.  
temperature coefficient of, and its relation to other properties, B., 1030.  
adsorption of gases by, A., 331, 1084.  
permeability of, to alcohol, ether, and water, A., 799.  
surface tension of, in relation to temperature, A., 460.  
introduction of hydrogen into, by electrolysis, A., 230.  
solubility of, in water in relation to its composition, B., 23.  
crystalline structure in, A., 904.  
temperature of disappearance of anisotropy in surface of, A., 10.  
effect of superficial treatment with oxides on hydrolytic properties of, B., 466.  
use of Armenian pumice and obsidian in, B., 422.  
use of arsenic, selenium, and tellurium in, B., 841.  
effect of calcium compound used in, on its properties, B., 641.  
effect of constituents of, on turbidity produced by addition of fluoride, B., 771.  
solution of gold in, and ruby colouring produced thereby, B., 63.  
use of granites and sienites in, B., 548.  
luminous effects produced by rolling of mercury alloys on, in vacuum, A., 213.  
use of decomposition products of, for purification of rare gases, (P.), B., 114.  
sealing of articles to, (P.), B., 936.  
sealing of metals to, (P.), B., 27, 936.  
production of fibres, etc., of, (P.), B., 642.  
production of spun threads from, (P.), B., 1081.  
manufacture of substitutes for, (P.), B., 600.  
analysis of, B., 725.  
micro-analysis of, B., 228, 262.  
detection in, of tin, without alkali fusion, B., 1030.  
determination in, of alkali, B., 262.  
of soluble silicates, B., 1120.
- Glass**, alkali-lead oxide-silica, volatilisation and vapour tension at high temperatures of, B., 982.  
ampoule, testing of, B., 384.  
ancient Roman, weathering and iridescence of, B., 104.  
borosilicate, refractories for melting and refining of, (P.), B., 888.  
bottle, decomposition of, by sulphuric acid, B., 799.  
compound, manufacture of, (P.), B., 105, 600, 888.  
with projecting intermediate layer, (P.), B., 937.

Glass, faience, Herrebo and Drammen, composition of, B., 1031.  
without lead, influence of oxide content on, B., 1030.  
fluoride opal, influence of heat treatment on opacity of, B., 983.  
gold, ruby, and sapphire, coloration and origin of, B., 228.  
for high-frequency electrical insulators, (P.), B., 507.  
laminated, (P.), B., 679.  
manufacture of, (P.), B., 262, 343, 422, 423, 936.  
apparatus for, (P.), B., 424, 937.  
ornamental, manufacture of, (P.), B., 888.  
lead, manufacture of, (P.), B., 983.  
solubility of, in water, B., 799.  
lead crystal, brilliant etching of, B., 883.  
lead oxide, effect of gases on, B., 982.  
lead silicate, solubility of, in water, B., 228.  
Lindemann, for protecting from X-rays, A., 1012.  
for lithographing, (P.), B., 147.  
medicinal, determination of alkalinity of, B., 104.  
non-splinterable, manufacture of, (P.), B., 262, 507, 642, 726.  
pressing process for, (P.), B., 549.  
opal, particle size and concentration in, B., 771.  
"opalised," for miners' lamps, etc., (P.), B., 842.  
optical, manufacture of, B., 383.  
patterned, production of, (P.), B., 384.  
plate, sulphuric acid in, during fusion, B., 22.  
scratching of, B., 146.  
potash-lead oxide-silica, corrosion of fireclay pots used for melting of, B., 982.  
pyrex, silvering and evacuation of Dewar flasks of, B., 181.  
safety, B., 548.  
manufacture of, (P.), B., 64.  
softening process in, B., 146.  
polymerisation products of acrylic acid for, (P.), B., 72.  
selenium ruby, colour of, B., 983.  
sheet, production of, (P.), B., 1081.  
by rolling, (P.), B., 106, 799.  
compound, manufacture of, (P.), B., 182.  
silica, drawing of tubing of, (P.), B., 642.  
silicate, effect of cerium and arsenic on photochemical behaviour of, B., 1030.  
soda-lime-silica, influence of ferrous oxide content on light transmission of, B., 383.  
effect of boric oxide on devitrification of, B., 1029.  
solubility of, in water, B., 23.  
soda-lime-silicate, clarification of, with antimonious oxide, B., 1079.  
sodium borate, ionic emission of, A., 1076.  
sodium silicate, containing iron oxides, B., 600.  
spun, heating of, (P.), B., 64.  
two-component, specific volume of, B., 384.  
ultra-violet transparent, (P.), B., 1032.  
undercooled, A., 217.  
white, manufacture of, (P.), B., 182.  
window, substitutes for, (P.), B., 462, 600.  
produced by Fourcault process, crystallisation of, B., 982.  
heat-absorbent, (P.), B., 1032.  
thin-blown, ultra-violet transmission by, A., 791.

14\*

Glass articles, manufacture of, (P.), B., 799.  
treatment of, (P.), B., 105.  
frothing of, (P.), B., 1032.  
hollow, frosting interior of, (P.), B., 1080.  
blocks, moulded, for building, (P.), B., 423.  
bottles, lehrs for annealing of, (P.), B., 772.  
tanks, blocks for, (P.), B., 343.  
solubility of, in hydrofluoric acid as measure of their solubility, B., 64.  
threads, production of, (P.), B., 937.  
tubes, manufacture of, (P.), B., 888.  
scaling-off of, (P.), B., 467.  
heat transfer through, B., 771.  
tubes and rods, manufacture of, (P.), B., 799.  
ware, manufacture of, (P.), B., 384, 467.  
plant for, (P.), B., 24.  
machines for, (P.), B., 642.  
annealing of, (P.), B., 1080.  
lehrs for, (P.), B., 105.  
electric lehr for, (P.), B., 771.  
surface treatment of, (P.), B., 549.  
testing of, B., 548.  
double-walled, manufacture of, (P.), B., 799.  
Glass electrodes. See under Electrodes.  
Glass sands. See under Sands.  
Glass state, conversion of crystallising substances into, A., 996.  
Glaucobilin, and its derivatives, A., 627.  
Glaucomite in fossil-bearing concretions, A., 39.  
Glazes, ring method for determination of stresses in, B., 307.  
resistance of, to crazing, B., 342.  
for pottery, etc., cleaning of, (P.), B., 423.  
containing cement, production of, (P.), B., 938.  
use of colemanite as, B., 23.  
containing lead, manufacture of, (P.), B., 983.  
copper-blue, at cone 9, B., 641.  
copper-red, production and control of, in an oxidising kiln atmosphere, B., 641.  
Egyptian-blue, B., 641.  
enamel, colouring of, (P.), B., 182.  
raw lead, colour formation in, B., 306.  
lead-zinc-titanium, B., 887.  
polychrome cone 6, B., 23.  
porcelain, cone 8, substitution in Seger formula for, B., 887.  
containing rare earths, absorption spectra of, A., 319.  
terra-cotta, crazing in, B., 23.  
discoloration of, B., 1031.  
white, production of, (P.), B., 343.  
opaque, frits for production of, (P.), B., 983.  
white-ware, opacifiers in, B., 548.  
influence of sulphur and carbon in kiln atmospheres on metal marking of, B., 228.  
Gliadin, A., 71, 529.  
isoelectric point of, A., 1202.  
colloid chemistry of separation of, A., 122.  
comparison of, with glutenin from the same flour, B., 444.  
Globin, denatured, A., 433.  
natural and denatured, isoelectric points and dissociation constants of, A., 763.  
Globulin, serum, isoelectric point of, A., 1271.  
precipitation of, A., 412.

Globulin, determination of, in blood-plasma, A., 183.  
Glucimiazole, and its thiol, A., 1043.  
 $\alpha$ -Glucosceptitol triphenyl methyl ether, A., 42.  
 $\alpha$ - $d$ -Glucoseptonolactone, tetra-acetyl derivative, A., 44.  
 $d$ - $\alpha$ -Glucoseptose, action of dilute alkali on, A., 723.  
 $\alpha$ -Glucoseptose series, Walden inversion in, A., 46.  
 $d$ -Glucoseptulose, action of dilute alkali on, A., 723.  
hexaacetate, A., 724.  
 $d$ -Glucosmethylose, identity of, with quinosose, A., 146.  
Gluconic acid, preparation of, A., 833.  
production of, by fermentation, (P.), B., 573.  
calcium salt, B., 840.  
manufacture of, by electrolytic oxidation of glucose, A., 602.  
solubility of, A., 16.  
in presence of sodium phosphate and arsenious acid, A., 1084.  
production of stable solutions of, (P.), B., 817.  
supersaturated solutions of, (P.), B., 48.  
hypodermic solutions of, A., 426.  
determination of, A., 44.  
 $d$ -Gluconic acid, conversion of, into oxalic acid by moulds, A., 1169.  
Glucono- $\gamma$ -lactone, manufacture of, (P.), B., 975.  
 $d$ -Glucosolactones, tetra-acetyl derivatives of, A., 44.  
Glucosamine, configuration of, A., 371.  
bacterial decomposition of, A., 1066.  
 $d$ -Glucosamine glucopeptides, synthesis of, A., 935.  
 $\beta$ -Glucosaminotrimethylammonium chloride hydrochloride, A., 371.  
 $l$ -Glucosanyl-xanthic acid, copper salt, A., 718.  
Glucose, structure and oxygen valency angle of, A., 1190.  
manufacture of, (P.), B., 858.  
changes in rotation of, A., 75.  
influence of hydrochloric acid on rotation of, A., 500.  
influence of sodium cholate, in presence of liver-enzyme preparations, on mutarotation of, A., 1237.  
spectrum of, A., 1020.  
photolysis of, A., 237.  
benzoylation of, in presence of boric acid, A., 723.  
decomposition of, B., 480.  
in low-grade massecuites, B., 442.  
oxidation of, A., 917.  
in presence of insulin, A., 346.  
action of aniline on, in presence of acetic acid, A., 1241.  
4-acetate *tetra*- and *diacetate tribenzoates* and *tri*- and *tetra*-benzoates, A., 1115.  
*di*- and *tri*-benzoates, A., 723.  
ureide, bacterial decomposition of, A., 196.  
use of, in manufacture of paper, B., 837, 1023.  
assimilation of, A., 85.  
fermentation of fructose and, by yeast, A., 651.  
 $d$ -gluconic acid from enzymic oxidation of, A., 1165.  
bacterial decomposition of, A., 1066.  
decomposition of, by pneumococcus, A., 653.

- Glucose, effect of gossypol on gastrointestinal absorption of, A., 89.  
 biological conversion of, into glucosone, A., 1289.  
 conversion of, into lactic acid in embryonic tissues, A., 1160.  
 distribution of, in human blood, A., 1152.  
 glycogenesis from administration of, in fasting, A., 538.  
 potato, production of, B., 280.  
 identification and determination of 6-hydroxyl group in, A., 254.  
 detection of, in urine, A., 767.  
 determination of, A., 1270.  
 iodometrically, A., 1269.  
 See also Dextrose.
- α*-Glucose, and its derivatives, A., 147.  
 Glucosediibenzamide, A., 147.  
 Glucosediiboric acid, A., 723.  
 Glucosephosphoric acid, synthesis of, by tuberculosis phosphatase, A., 874.  
 Glucose-sulphuric acid, hydrolysis of, by sulphatase, A., 650.  
*α*-Glucosidase, fission of disaccharides by, A., 543.  
 separation of, from *β*-*h*-fructosidase, A., 1063.
- Glucosides, production of explosives from, (P.), B., 914.  
 nitrogenous, A., 1021.
- Glucosides. See also:—  
 Citronin. Salicin.  
 Hiviscin. Salinigrin.  
 Lusitanicoside. Tabacinin.  
 Neriin. Tabacinin.
- β*-Glucosides, asymmetric hydrolysis of, with emulsin, A., 816.  
*γ*-Glucosides, structure of, A., 724.  
 3-Glucosidoarabinose *hept*acetate, action of potassium hydroxide on, A., 369.  
*α*-4-Glucosido-*l*-glucosan, and its hexaacetyl derivative, A., 835.  
 4-Glucosidomannose, derivatives of, A., 255.  
 4-Glucosido-*β*-methylmannoside, A., 255.  
 Glucosidopyridinium chloride, A., 369.  
 2-*β*-Glucosidylthiuridin chloride, A., 1140.  
*β*-Glucosidylpelargonidin salts, isomeric, A., 859.  
 2-Glucosoxyanthraquinone, 9:9-diamino-1-hydroxy-, diacetyl derivative, A., 603.  
 Glucosulphatase from snails, A., 92.  
 Glucosuria, A., 416.  
 Glucosylxanthic acid, copper salt, A., 718.  
 Glue, production of, from bones, etc., (P.), B., 274, 316.  
 adhesion of, B., 439.  
 abating foaminess in, (P.), B., 780.  
 moulding of, (P.), B., 853.  
 storage and examination of, B., 853.  
 preparation of test solutions of, B., 157.  
 manufacture of solutions of, (P.), B., 1094.  
 determination of strength of gels of, B., 853.  
 for sealing paper bottles, (P.), B., 238.  
 casein, manufacture of, (P.), B., 905.  
 retarding of setting of, (P.), B., 690.  
 cold, B., 905.  
 caterpillar, testing of, B., 853.  
 chrome-leather, B., 853.  
 hide and bone, evaluation of, B., 73, 616.  
 vegetable, manufacture of, (P.), B., 121.  
 reduction of water requirement of, (P.), B., 905.  
 waterproof, (P.), B., 616.  
 manufacture of, (P.), B., 1094.  
 analysis of, B., 1001.
- Glue powder, production of, with casein base, (P.), B., 360.
- Glutaconic acid, and its ethyl ester, preparation of, A., 1234.  
 Glutaconic acids, and their esters, structure of, A., 252, 601, 1127, 1247.  
*β*-substituted, A., 512.  
 Glutamic acid, A., 503.  
 synthesis of, A., 150.  
 from insulin, A., 972.  
 hydantoins of, A., 184.  
 peptide of, in seaweeds, A., 101.  
 peptides of, A., 291.  
*d*-Glutamic acid, salts, tastes of, A., 503.  
*i*-Glutamic acid, *β*-hydroxy-, synthesis of, and its salts and derivatives, A., 257.  
 Glutamic-*N*-sulphonic acid, and its potassium salts, A., 1023.  
 Glutamine, determination of, in presence of asparagine, A., 660.  
*d*-Glutamylamide, and its derivatives, A., 291.  
*d*-Glutamyl-*d*-glutamic acid, A., 936.  
*γ*-Glutamylglycine, ethyl ester, A., 291.  
 Glutaranilamide-*p*-arsinic acid, ammonium salt, A., 291.  
 Glutaranilide-*p*-arsinic acid, and its sodium salt, A., 291.  
 Glutaranilide-*pp'*-diarsonic acid, and its disodium salt, A., 291.  
 Glutaranilodimethylamide-*p*-arsinic acid, and its sodium salt, A., 291.  
 Glutaraniloethylamide-*p*-arsinic acid, and its sodium salt, A., 291.  
 Glutaranilomethylamide-*p*-arsinic acid, and its sodium salt, A., 291.  
 Glutaranilo-*n*-propylamide-*p*-arsinic acid, and its sodium salt, A., 291.  
 Glutaric acid, preparation of, A., 385.  
*p*-phenylphenacyl ester, A., 745.  
*αα*-diacyl derivatives, ethyl esters, cleavage of, A., 1112.  
 Glutaric acid, *αα*-dibromo-, ethyl ester, condensation of, with thiocarbamides, A., 758.  
*α*- and *β*-Glutaric acids, A., 327.
- Glutathione, structure and derivatives of, A., 184.  
 from potatoes treated with ethylene chlorohydrin, A., 889.  
 catalysis of oxidation of, A., 27, 77.  
 reduction of, by liver systems, A., 880.  
 in mammalian red blood-corpuscles, A., 880.  
 arylthioarsinites of, A., 1268.  
 polypeptides, A., 762.  
 as activator of amylase, A., 304.  
 as complement of amylases, A., 1063.  
 inactivation of insulin by, A., 96.  
 inhibition of liver-arginase by, A., 1167.  
 in metabolism, A., 85.  
 effect of, on autolysis and on protein metabolism, A., 771.  
 on oxygen tension of venous blood, A., 1156.  
 on the Pasteur reaction, A., 1056.  
 in blood, A., 634.  
 in tissues, influence of Chosen ginseng on, A., 1163.  
 on vitamin-C-free diet, A., 419.  
 of frogs with low temperature, A., 1164.  
 of rabbits after heart puncture and peptone injection, A., 1164.  
 cuprous, A., 636.  
 oxidised, copper compound of, A., 77.  
 determination of, in blood, A., 74.  
 reduced, in organ tissues in disturbed liver function, A., 536.  
 in rabbit tissues, A., 1156.  
 content of, in toxic and infected conditions, A., 187.
- Glutathione, determination of, A., 413.  
 in blood, A., 1053.  
 in blood and tissues, A., 531, 1152.
- Glutelins, A., 1051.  
 determination in, of cystine and tryptophan, A., 1051.
- Gluten, determination of specific gravity of, B., 283.  
 colloid chemistry of, A., 1202; B., 283.  
 proteins, preparation and heat denaturation of, A., 71.  
 determination of, B., 283.  
 in flour, B., 655.
- Glutenin, preparation of, in carbamide solutions, A., 71.  
 isoelectric point of, A., 1202.  
 comparison of, with gliadin from the same flour, B., 444.
- Glucose, unfermentable constituents of, A., 147.
- Glyceraldehyde, fermentation of, A., 429.  
 benzyl- and methylcyclo-acetals, and their derivatives, A., 364, 367.
- Glyceraldehydebenzylcycloacetalphosphoric acid, and its salts, A., 364.
- Glyceraldehyde-*γ*-phosphoric acid, A., 834.  
 and its 2:4-dinitrophenylhydrazones, A., 364.  
 calcium salt, dihydrate of, A., 834.
- Glycerides, synthetic, A., 364.
- Glycerin. See Glycerol.
- Glyceroboric acid, manufacture of, B., 399.
- Glycerol (*glycerin*), manufacture of, (P.), B., 435.  
 by fermentation, (P.), B., 44.  
 purification of, (P.), B., 777.  
 purification and distillation losses of, B., 559.  
 concentration of liquors containing, (P.), B., 612.  
 purification of aqueous liquors containing, B., 390.  
 refractive index of, A., 984.  
 esterification in, A., 1210.  
 condensation of, with phthalic anhydride, A., 945.  
 reactions of, A., 718.  
 action of hydriodic acid on, A., 362.  
 complex ferric compound of, A., 362.  
 derivatives, A., 598.  
 preparation, properties, and uses of, A., 41.  
 chlorohydrins, preparation of, A., 41.  
 esters of, A., 364, 599.  
 arsenite, A., 937.  
*α*-diethyl and *α*-diphenyl ethers, formation of, from *α*-dichlorohydrin, A., 928.  
*α*-phenyl ether, A., 928.  
 trinitrate (*nitroglycerol*), production of, (P.), B., 865.  
 decacidification of, (P.), B., 242.  
 powder, chemical stability of, B., 705, 1009.  
 determination of, in drugs, by the acid distillation method, B., 622.  
 in pharmaceutical preparations, A., 964.  
 determination of, in fatty oils, B., 686, 850.
- Glycerol, thio-, derivatives of, A., 45.
- Glycerophosphatase, influence of bile acids on, A., 305, 427, 1288.
- Glycerophosphomolybdic acid, salts, A., 143.
- Glycerophosphoric acid, salts, determination of, mercurimetrically, A., 1010.  
 calcium salt, stability of aqueous solutions of, B., 399.  
 analysis of, B., 286, 1118.

- Glycerophosphoric acid**, sodium salt, isolation and identification of, A., 251.  
*p<sub>H</sub>* of solutions of, B., 79.
- Glycerophosphoric acids**, A., 831.
- 6-Glycerylamidoquinoline methiodide**, A., 623.
- Glycerylxanthic acid**, copper salt, A., 718.
- Glycidic acid**, esters, Claisen-Darzens synthesis of, A., 143.
- Glycidic acids**, formation of  $\alpha$ -glycols by reduction of, A., 1110.
- Glycidol**, A., 364.
- Glycidyl ethyl ether**, preparation of, A., 598.
- Glycine**, isoelectric points of, A., 807.  
 capillary behaviour of, A., 909.  
 alkaline hydrolysis of peptides of, A., 935.  
 crystal structure of polypeptides of, A., 451.  
 effect of injection of, on serum-calcium, A., 1152.  
 determination of, colorimetrically, A., 503.
- Glycine anhydride**, A., 836.
- Glycine soja**, lipoxidases of, A., 967.
- Glycine-N-sulphonic acid**, and its salts, A., 1023.
- Glycinin**, action of seedling enzymes on, A., 202.
- Glycocholic acid**, additive compounds of, A., 56.
- Glycogen**, A., 836, 934.  
 molecular structure of, and its triacetate, A., 1022.  
 in relation to starch, A., 91.  
 acetylation and methylation of, A., 934.  
 hydrolysis of, by acids and by taka-diastase, A., 77.  
 triphenylmethyl ether of, A., 501.  
 formation of, on fat diet, A., 298, 770.  
 from lactic acid in liver, A., 86.  
 in liver and muscle by bile acids, A., 644.  
 in liver after phosphate administration, A., 1282.  
 in muscle, A., 420, 771.  
 in denervated muscle, A., 298.  
 effect of insulin and of trypan on, A., 425.  
 equilibrium of, in liver pulp and in solution, A., 1274.  
 storage of, in liver, A., 765, 766.  
 effect of organic acids on deposition of, in liver, A., 1160.  
 significance of, in liver function, A., 538.  
 in liver on feeding with glyceraldehyde, methylglyoxal, and pyruvic acid, A., 645.  
 effect of yeast on, A., 421.  
 in liver and muscle, effects of iodine, pituitrin, and sulphur on, A., 1285.  
 determination of, in tissues, A., 77.
- Glycogenesis**, A., 645.
- Glycogenolysis**, adrenaline, effect of lactic acid on, A., 1171.
- Glycol**. See Ethylene glycol.
- Glycols**, production of, (P.), B., 494.  
 formation of, by reduction with fermenting yeast, and their configurations, A., 143.  
 dehydration of, A., 388, 389, 393.  
 ethers, syntheses of, A., 363.  
 manufacture of alkyl ethers of, (P.), B., 591.
- $\alpha$ -**Glycols**, ethyl ethers of, A., 41, 143, 368, 831.
- $\alpha$ -**Glycols**, formation of, from glycidic esters, and their transformation into alcohols, A., 1110.
- Glycolase**, stability of, A., 778.
- Glycollaldehyde**, bromo-, derivatives of, A., 45.
- Glycollamide-acetone**. See 4-Keto-2:2-dimethyltetrahydro-oxazole.
- Glycollic acid**, production of, by moulds, A., 1168.  
 lead salt, A., 598.  
 complex vanadium compounds of, A., 31.  
 cellulose ester. See under Cellulose.  
 methyl ester, compound of, with boron trifluoride, A., 728.  
 determination of, in presence of lactic and  $\alpha$ -hydroxybutyric acids, A., 720.
- Glycollic acid**, thio-, oxidation-reduction potential of, A., 472.  
 reaction of, with caoutchouc, A., 1139.
- Glycolysis**, A., 413.  
 in blood, A., 1273.
- Glycuronic acid**, in urine, influence of Chosen ginseng on, A., 1163.  
 influence of liver on, A., 1158.  
 determination of, in blood and in urine, A., 640.
- Glycuronides**, flavone, enzymic hydrolysis of, A., 650.
- Glycylbenzylamine**, phenylcarbamido-derivative, A., 71.
- Glycyldehydrophenylalanine**, chloroacetyl derivative, A., 427.
- $\alpha$ -**Glycyl dipalmitin**, A., 364.
- $\alpha$ -**Glycyl distearin**, A., 364.
- N-Glycylglucosamine hydrochloride**, A., 935, 1118.
- $\alpha$ -**Glycylglyceride**, A., 364.
- Glycylglycine**, mitogenetic spectra of fission of, by erepsin and of peptic digestion, A., 1166.
- Glycylglycine-N-sulphonic acid**, and its potassium salt, A., 1023.
- Glycyl-D-leucyl-D-leucyl-D-leucine**, A., 1269.
- Glycylserine-N-sulphonic acid**, and its potassium salt, A., 1023.
- Glycylserylprolyltyrosylproline**, isolation of, in degradation of silk fibroin, A., 1141.
- Glycyltyrosine**, titration constant of, A., 468.
- Glycyl-L-tyrosine**, catalytic deamination of, A., 1165.
- Glycyltyrosine-ON-disulphonic acid**, and its potassium salt, A., 1023.
- Glycyrrhizin**, hæmolytic action of, A., 76.
- Glyoxal sulphate**, constitution of, A., 250.
- Glyoxals**, fate of, in the body, A., 298.
- Glyoxalase**, properties of, A., 650.
- Glyoxaline**, and its derivatives, ultra-violet absorption spectra of, A., 792.  
 production of derivatives of, (P.), B., 496.  
 additive compound of, with hæmatin, A., 757.
- Glyoxalines**, syntheses with, A., 1144.  
 chloroaurates, A., 625.  
 substituted, preparation of, A., 371, 864.
- Glyoxalines**, 4(5)-amino-, formation of, A., 1144.
- Glyoxaline-1-acetic acid**, and its ethyl ester, pierate of, and 2-thiol-, A., 864.
- Glyoxalinecarboxylamide**, and its pierate, and 2:5-dibromo-, A., 1144.
- Glyoxaline-4-carboxylic acid**, amide of, A., 934.
- Glyoxaline-5(4)-carboxylic acid**, 4(5)-bromo-, non-reactivity of halogen atom in, A., 1144.
- Glyoxaline-hæmatins**, A., 757.
- Glyoxaline-hæmin**, spectrum and catalytic effects of, A., 412.
- Glyoxalinyethyl alcohol**, spectro-analysis of glyoxaliny-lactic acid and, A., 1188.
- Glyoxaliny-lactic acid**, spectro-analysis of glyoxalinyethyl alcohol and, A., 1188.
- 8-(Glyoxaliny-1')-6-methoxyquinoline**, and its hydrochloride, and 8-thiol-, A., 864.
- (Glyoxaliny-1')-quinolines**, and thiol-, and their hydrochlorides, A., 864.
- Glyoxime NN'-dichloro-4-methoxy- and NN'-di-4-methoxy-phenyl ethers**, A., 734.
- Glyoxime**,  $\beta$ -cyano-, and its derivatives, A., 1267.
- Glyoximes**, and amino-, dicarbanil derivatives of, A., 513.
- Glyoximes**, chloro-, dicarbanil derivatives, A., 1146.
- Glyoxylanilide phenylhydrazone**, A., 50.
- Glyoxylic acid**, production of, by moulds, A., 1168.
- Glyoxylic acid**,  $\alpha$ -amino-, *mono-* and *tri-bromo-* and  $\alpha$ -chloro-, ethyl esters, 2:4:6-*tribromo-* and 2:4:6-*trichloro-*phenylhydrazones, A., 377.  
 $\alpha$ -bromo- and  $\alpha$ -chloro-, ethyl esters, *mono-* and *di-bromo-* and *mono-* and *di-chloro-*phenylhydrazones, A., 1125.
- Gmelin reaction**, A., 627.
- Gnats**, preparation for repelling, (P.), B., 578.
- Gneiss**, garnet, and cordierite, from Burma, A., 1107.
- $\psi$ -**Gnoscopine**, and amino-, iodo-, and nitro-, and their derivatives, A., 759.
- Goats**, effect of autoclaved cow's milk and of vitamins on growth of, A., 200.
- Goat fat**, determination of solid fatty acids in, B., 849.
- Goethite**, constitution of, A., 805.  
 formation of, A., 1216.
- Goitre**, A., 641.  
 substances producing, and essential fatty acids, A., 418.  
 in relation to iodine content of food, A., 641.  
 mineral metabolism in, A., 187.  
 mineral and iodine content of tissues in, A., 1279.  
 basal oxygen consumption of rats with, A., 1157.  
 in Alberta, relation between iodine in water supply and, A., 1227.  
 in Lettland in relation to iodine, A., 419.  
 endemic, in New Zealand, iodine in relation to, A., 768.
- exophthalmic**, isoelectric point of hæmoglobin and chlorine distribution in, A., 187.  
 fluorides in treatment of, A., 1157.  
 gastric secretion in, A., 641.  
 influence of insulin on sulphur metabolism in, A., 1157.  
 iodine dosage in, A., 419.  
 effect of thyroxine in, A., 1157.  
 non-toxic, iodine content of blood in, A., 1278.
- Gold** in spathic iron of Siegerland, A., 494.  
 extraction of, by flotation, B., 553.  
 effect of addition of salt to cyanide solutions for, B., 511.  
 recovery of, from graphitic and non-graphitic waste, B., 1084.  
 from shales, (P.), B., 472, 731.  
 absorption spectrum of, A., 3.  
 arc spectrum of, A., 104, 552.  
 photo-electric emission of, A., 316.  
 diffraction of electrons by single crystals of, A., 209.  
 transport number of, in amalgams, A., 1092.  
 electrochemistry of, in hydrobromic and hydrochloric acid solutions, A., 472.  
 electrodeposition of, on plates, bands, etc., (P.), B., 610.  
 electro-deposition of micro-crystals of, A., 564.



**Gold**, solutions for electroplating with, B., 1085.  
 passivity of, A., 1209.  
 adsorption of ethylene and carbon dioxide by, A., 223.  
 adsorption of carbon dioxide, ethylene, and hydrogen by, A., 1199.  
 diffusion of copper into, A., 454.  
 solubility of, in glass, and ruby colour produced thereby, B., 63.  
 in mercury, A., 990.  
 action of cyanides on, A., 705.  
 in biological materials, A., 294.  
 absorption and excretion of thio-compounds of, A., 302.  
 colloidal, constitution of, A., 225, 994.  
 formation of, A., 994.  
 preparation of, A., 1086.  
 for the Lange test, A., 225.  
 absorption spectrum of solutions of, A., 691.  
 effect of  $p_H$  on precipitating and protective action of proteins on, A., 226.  
 hydrosols, viscosity of, A., 909.  
 influence of non-electrolytes on coagulation of, A., 571.  
 sols, constitution of, A., 570.  
 preparation of, A., 909, 1201.  
 with electrodialysed water, A., 335.  
 coagulation of, A., 19.  
 electrophoresis of, with agar, A., 336.  
 reactions of, with proteins, A., 996.  
 influence of gases on stability of, A., 462.  
 standardisation of, A., 1058.  
 for cerebrospinal fluid tests, A., 805.  
 powdered, adsorption of fatty acids by, in various solvents, A., 689.  
**Gold alloys**, production of, (P.), B., 191.  
 with cadmium, crystal structure of, A., 986.  
 with copper, A., 566, 989.  
 mixed crystals of, A., 1095.  
 transformations in, A., 1196.  
 with copper and silver, (P.), B., 609.  
 with iron, magnetic properties of, A., 112.  
 with mercury, A., 566.  
 with palladium, crystal structure of, A., 221.  
 with platinum, A., 221.  
 age-hardening of, B., 266.  
 with silver, A., 800.  
 Hall effect in, A., 565.  
 Hall effect and lattice constant of, A., 12.  
 superconductivity of, A., 800.  
**Gold chloride**, action of oxides on, in light, A., 1097.  
 trivalent, solutions of, A., 1092.  
 oxide, interference colours of layers of, A., 676.  
**Gold organic compounds**, A., 69.  
 production of, (P.), B., 577.  
**Gold determination** :—  
 determination of, potentiometrically, A., 1104.  
 volumetrically, in bullion and alloys, B., 511.  
**Gold electrodes**. See under Electrodes.  
**Gold foil**, surface tension of, A., 452.  
**Gold ores**, treatment of, B., 892.  
 flotation of, B., 1036; (P.), B., 151.  
 arsenical, treatment of, (P.), B., 471.  
 low-grade, cyaniding of, B., 309.  
 Rand, residual gold after cyanidation of, B., 892.  
**Goldfish**, pigment of skin of, A., 766.  
 toxicity of organic thiocyanates and thiocarbimides to, A., 964.  
 toxicity of plant extracts to, B., 479.

**Golf balls**. See under Balls.  
**Gonads**, influence of, on protein metabolism, A., 656.  
**Gonadectomy**, effect of, on calcium exchange in, A., 971.  
**Gonnardite**, A., 715.  
**Gonococcus**, medium for production of toxin of, (P.), B., 961.  
 oxidation produced by, A., 1170.  
 effect of sodium ricinoleate on, A., 198.  
**Gossypol**, and its derivatives, A., 1257.  
 toxicity of, A., 89.  
**Gossypolic acid**, A., 1257.  
**Gout fly**, prevention of, B., 124.  
**Grain**, apparatus for drying of, (P.), B., 532.  
 heating of, in storage, B., 860.  
 sterilisation and bleaching of, B., 1004.  
 seed, arsenical dressing for, (P.), B., 1003.  
 spring, top-dressing of, with potash, B., 567.  
**Gramineæ**, active substances in pollen of, A., 1178.  
 fat and fatty acid contents of seeds of, A., 974.  
**Gramophone records**, manufacture of, (P.), B., 32, 197.  
 moulds for, (P.), B., 32.  
**isoGranatanine**. See 3:5-Trimethylene-piperidine.  
**Granite**, origin of magmas of, A., 715.  
 solubility of water in magmas of, A., 223.  
 melting of, A., 492.  
 artificial, manufacture of, (P.), B., 425.  
 Dartmoor, A., 715.  
 in Eastern Ontario, A., 359.  
 Finland, A., 359.  
 of Maczulanka, A., 1229.  
 in S.E. Missouri, relation of, to rhyolites, A., 494.  
**Grapes**, maturity test for, B., 911.  
 potassium fertilisers for, B., 1002.  
 effect of, on urinary acidity, A., 1056.  
 Malaya and Sultanina, vitamins in, A., 547.  
**Grape juice**, manufacture of, B., 1006.  
 free sulphur dioxide in, B., 46.  
 vitamins in, A., 547.  
**Grape-seed oil**, A., 313.  
 phytosterols of, A., 888.  
**Grapefruit**, premature flowering of, after irradiation, A., 1182.  
 canned, vitamins in, B., 655.  
**Graphite**, grinding of, (P.), B., 410.  
 superconductivity of, A., 683.  
 swelling of, A., 808, 1192.  
 as a disperse laminar system, A., 317.  
 production of colloidal suspensions of, in oils, (P.), B., 298.  
 action of alkali metals on, A., 903.  
 reaction of, with oxygen, A., 816.  
 treatment of articles of, (P.), B., 827.  
 substances analogous to, A., 1109.  
 colloidal, lubrication with, B., 1110.  
 crystalline, electron velocities in, A., 670.  
 action of oxygen on, A., 795.  
 natural and artificial, properties of, B., 967.  
 powdered, rate of oxidation of silicon carbide and, B., 841.  
 determination in, of sulphur, B., 51, 326.  
**Graphitisation**, B., 134.  
**Grass**, effect of cutting and fertilisers on development of, B., 200.  
 relation of  $p_H$  of soils to growth of, B., 1096.  
 proteins of, A., 662.

**Grass**, leaching of phosphorus compounds and proteins from, by rain, B., 953.  
 wilting and withering of, in relation to water supplying power of soils, B., 440.  
 influence of soil reaction and manuring on composition of mixtures of clover and, B., 1047.  
 cut, drying of, (P.), B., 163.  
 forage, glyceride fatty acids of, A., 662.  
 phosphatides of, A., 1179.  
 wax constituents of, A., 204.  
 pasture, composition of, A., 549.  
 cystine in, B., 39.  
 sulphur in, B., 39.  
 rye. See Rye grass.  
 sour meadow, as silage and hay for milch cows, A., 86.  
 Sudan, hydrocyanic acid in, A., 888.  
 timothy, polysaccharide from pollen of, A., 1177.  
**Grass silage**, feeding value of, B., 697.  
**Grass tree**. See *Xanthorrhoea*.  
**Grassland**, management of, and digestibility and feeding value of grass therefrom, B., 696.  
 nitrogenous manuring of, B., 38.  
**Gravel**, screening plant for, (P.), B., 184.  
**Gravitation** as natural magnetism, A., 896.  
**Greases**, plant for removal of, (P.), B., 70.  
 dyed and scented, (P.), B., 11.  
 lubricating. See Lubricating greases.  
**Greensand**, treatment of, (P.), B., 1079.  
**Grignard reaction**, diisopropyl ether as solvent in, A., 728.  
**Grignard reagents**, factors influencing yield of, A., 728.  
 reducing action of, A., 837.  
 reaction of, with aliphatic ketones, A., 598.  
 furan, A., 278.  
**Grinding apparatus**, (P.), B., 3, 85, 132, 405, 531, 787, 867, 916, 964, 1108.  
 feeding device for, (P.), B., 453.  
 hand operated mortar for, (P.), B., 453.  
 dressing of stones for, (P.), B., 1060.  
 for enamels, etc., (P.), B., 453.  
 for pulpy semi-liquid materials, (P.), B., 1012.  
 for ores, sand, etc., (P.), B., 292.  
**Grinding wheels**, manufacture of, (P.), B., 423.  
 for flour, pulp, etc., (P.), B., 485.  
**Grit**, tank for washing of, (P.), B., 889.  
**Grochauite** of corundum rocks, A., 248.  
**Grog bodies**, testing of, by gas permeability, B., 983.  
**Growth**, substances promoting, A., 201, 661.  
 retention of elements during, A., 876.  
 water-soluble factors for, A., 550.  
*Gryllus assimilis*. See Crickets, field.  
**Guaiacol**, equilibrium of, with phenylene-diamines, A., 697.  
 colour reactions of preparations of, B., 863.  
 evaluation of pharmaceutical preparations of, B., 286.  
 determination of, in urine, A., 535.  
**Guaiacol**, *tribromo*-, constitution of, and 6-bromo-5-amino-, and its salts, A., 1027.  
**Guaiacum resin**. See under Resins.  
**Guanidine**, isolation of, A., 890.  
 and its alkyl derivatives, ionisation constants of, A., 605.  
 salts, preparation of, from ammonium thiocyanate, B., 414.  
 carbonate, separation of titanium by, A., 1224.  
 intoxication by, in infants, A., 873.  
 effect of, on metabolism, A., 774.

Guanidine, and its derivatives, effect of, on amylase, A., 881.  
 Guanidine, nitro-, reduction of, A., 472.  
 Guanidines, resistance of, to guanidodeimidase and arginase, A., 779.  
 diacetyl reaction of, A., 834.  
 Guanine, determination of, in tissues, A., 870.  
 Guano, pigeon, B., 781.  
 Guanosine, ring structure of, A., 1043.  
 Guanycarbamide phosphate, A., 913.  
 Guanylic acid, comparative rate of hydrolysis of, with adenylic and xanthylic acids, A., 71.  
 degradation of, in rabbit's liver, A., 881.  
 Guarana, caffeine and theobromine in, A., 204, 1178.  
 determination in, of caffeine, B., 367.  
 Guinea-pigs, sulphur metabolism of, in vitamin-C-free diet, A., 887.  
 Gums, constituents of, A., 665.  
 "running" of, B., 196.  
 spreading of dyes on surfaces of, A., 691, 1085.  
 compositions of resins and, (P.), B., 650.  
 ester, manufacture of, (P.), B., 737.  
 kauri, solubility of, in alcohol-toluene mixtures, B., 778.  
 vegetable, manufacture of solutions of, (P.), B., 858.  
 determination of, in gasoline, B., 7, 1065.  
 in motor fuels, B., 536.  
 Gum arabic, inactivation, viscosity, and  $\eta_{sp}$  of solutions of, A., 122.  
 oxidising enzymes in, and their inactivation, B., 397.  
 sols, effect of electrolytes on, A., 1087.  
 autocomplex coacervation of, A., 693.  
 coacervation of mixtures of gelatin sols and, A., 337.  
 Gum benzoin, effect of  $\eta_{sp}$  on precipitating and protective action of proteins on, A., 226.  
 Gum hydrocarbons, treatment of, (P.), B., 280.  
 Guns, shot. See Shot guns.  
 Guncotton. See Cellulose nitrate.  
 Gunpowder, instability of, B., 1105.  
 K-Gutta, use of, as insulation for submarine cables, B., 155.  
 Gutta-percha, B., 32.  
 extraction of leaves of, B., 32.  
 heat-treatment and polymorphism of, B., 949.  
 oxidation of, B., 315.  
 with hydrogen peroxide, A., 398.  
 hydrocarbons from, A., 275, 1036.  
 refractometry of, B., 949.  
 resin in, B., 1040.  
 for nitrocellulose lacquers, B., 778.  
 porous, production of, (P.), B., 476.  
 See also Rubber.  
 Gypsum, transparency of, to ultra-violet light, A., 211.  
 catalytic dissociation of, A., 1213.  
 velocity of solution of, A., 702.  
 concrete from, (P.), B., 425.  
 Gyrophoric acid, synthesis of, A., 851.

## H.

Haddock, muscle of. See under Muscle.  
 Hæmatin, solubility of ethyl chloride in, A., 301.  
 additive product of, with glyoxaline, A., 757.  
 Hæmatommanilide. See 3-Formyl-6-methylbenzanilide, 2:4-dihydroxy-.

Hæmatommic acid, A., 61.  
 Hæmatopoiesis and endogenous uric acid, A., 962.  
 Hæmatoporphyrin III, A., 173.  
 Hæmatoxylin, staining with, A., 786.  
 used with Mallory's connective tissue stain, A., 1154.  
 Hæmin, preparation of crystals of, from blood, A., 292.  
 Hæmin III, synthesis of, A., 172.  
 Hæmins, A., 292, 1205.  
 green and mixed, conversion of carbon monoxide to dioxide by, A., 182.  
 Hæmochromatosis, carbohydrate metabolism in, A., 1057.  
 Hæmocyanin of snails, properties of, A., 530.  
 Hæmocyanins, physico-chemical properties of, A., 1151.  
 Hæmoglobin, effect of chlorophyll on formation of, A., 1151.  
 effect of copper and iron on formation of, in pigs, A., 412.  
 effect of pyrrole derivatives on formation of, A., 1151.  
 effect of soya-bean products on formation of, A., 1151.  
 effect of manganese and plant ash on synthesis of, A., 1052.  
 oxidation-reduction potential of met-hæmoglobin and, A., 1270.  
 photochemical degradation of, A., 634.  
 solubility of, A., 73.  
 in chloride and sulphate solutions, A., 338.  
 effect of salts on dissociation curve of, A., 411.  
 diffusion of, in colloidal and molecularly disperse solutions, A., 18.  
 oxidation of, by methylene blue, A., 73.  
 carbon monoxide affinity for, A., 963.  
 specificity of precipitins for, A., 183.  
 treatments for regeneration of, A., 955.  
 influence of food on regeneration of, A., 868.  
 uniformity of prosthetic group of, from various sources, A., 1052.  
 in relation to mercury poisoning, A., 879.  
 renal thresholds for, in dogs, A., 956.  
 influence of base-binding power of, on osmotic hæmolysis, A., 957.  
 effect of, on metabolism of urobilin substances, A., 534.  
 and its derivatives, effect of, on solubility of ethyl chloride in water, A., 300.  
 in blood of dairy cattle, A., 955.  
 of muscle, absorption spectrum of, A., 982.  
 artificial, A., 492.  
 crystalline, from human blood, A., 1052.  
 human, sulphur content of, A., 1151.  
 determination of, A., 292.  
 by means of benzidine, A., 530.  
 microchemically, A., 1151.  
 $\alpha$ -,  $\beta$ -, and  $\gamma$ -Hæmoglobins, A., 292.  
 physical chemistry of, A., 433.  
 Hæmoglobinometer, Sahli cyanohæmatin standard for, A., 1270.  
 Hæmoglobinometry, A., 182.  
 Hæmolysis, effect of glucose on production and action of, A., 293.  
 kinetics of, A., 413.  
 cold non-complementary, A., 532.  
 osmotic, A., 957.  
 Hæmophilia, fluorine in blood in, A., 1158.  
 Hæmopyrrolecarboxylic acid, condensation product of, with paracetaldehyde, A., 1263.  
 derivatives of, A., 282.

Hæmotoxin, bacterial, A., 430.  
 cold, A., 532.  
 in heated serum, A., 184, 414.  
 Hæmozoin, A., 1057.  
 Hafnium dioxide, melting point of, A., 453.  
 Hair, scale structure of, A., 415.  
 liberation of, from hides and skins, (P.), B., 811.  
 composition for removal of, B., 393.  
 preparation for rinsing of, (P.), B., 798.  
 dyeing of. See under Dyeing.  
 dyes for, (P.), B., 798.  
 Dopa reaction applied to pigments in, A., 766.  
 animal, B., 565.  
 cleansing of, from tar and paint stains, (P.), B., 257.  
 horse, artificial, manufacture of, (P.), B., 97.  
 human, vapour pressure equilibria of, with water, A., 992.  
 cystine content of, A., 870.  
 effect of descaling on sulphur content and regain of, B., 334.  
 detection of dyes in, B., 502.  
 Halibut liver oil, vitamin-A in, A., 656, 782.  
 Halicystis, protoplasmic potentials in, A., 1180.  
 Halicystis ovalis, properties of cell-sap of, A., 977.  
 Halides, binary systems of, A., 1197.  
 molecular compounds of, with hydroxy-azo-compounds, A., 583.  
 inorganic, A., 793.  
 energy relations in, A., 217, 449.  
 and their molecular compounds, A., 447, 676.  
 non-metallic, A., 132, 1008.  
 organic, reaction of, with piperidine, A., 280.  
 adsorption indicators for determination of, A., 1009.  
 Haliotis, pigments of, A., 294.  
 Haliotis giganteus, intestinal enzymes of, A., 637.  
 Hall effect, A., 327.  
 and superconductivity, A., 114.  
 variation of, in magnetic fields, A., 452.  
 Hallwachs effect in compounds of elements with variable valency, A., 1076.  
 Haloform reaction, A., 164, 514, 1133.  
 Halogens, molecular weights of, A., 1193.  
 electron affinity of, A., 791.  
 $\psi$ -Halogens, A., 241, 505, 605, 933, 1120.  
 Halogen compounds, inhibition of fermentation by, A., 1167.  
 Halogen hydrides, heat capacities of, at high temperatures, A., 988.  
 crystal structure of, A., 326.  
 energy diagrams of, A., 125.  
 effect of, on metabolism, A., 774.  
 Halogen organic compounds, heat of combustion of, A., 812.  
 application of electronic theory of reactions to, A., 504.  
 photosynthesis of *cis*- and *trans*-isomerides of, A., 838.  
 catalytic action of aluminium chloride on, in presence of cycloparaffins, A., 49.  
 excretion of, in urine, A., 1060.  
 identification of, by means of 3-nitro-phthalimide, A., 1231.  
 determination of, microchemically, A., 1149.  
 in organic compounds, A., 867, 955, 1051.  
 Halophytes, chemistry of, A., 663.  
 adaptation of, to concentrated salt solutions, A., 786.  
 Hams, packing of, for export, B., 366.

- Hanks, slatting machines for, (P.), B., 258.  
Hanksite, crystal structure of, A., 12.  
Hantzsch-Werner theory, A., 743.  
Haptene, combination of, with an antibody, A., 184.  
Haptenes, masking of, by lipins, A., 414.  
Harbortite, in phosphatised laterite, A., 1229.  
Hardness, Rockwell tester for, B., 942.  
of surfaces, apparatus for testing of, B., 867.  
Harmine, tests for, A., 1284.  
Harmol, pharmacology of alkyl derivatives of, A., 424, 647.  
Hausmannite, synthesis of, A., 1229.  
Hay, treatment of, (P.), B., 160.  
Heart, production of ammonia in, A., 771.  
action of calcium on, A., 192.  
action of Japanese camphor on, A., 948.  
action of ions on ageing of juices from, A., 299.  
congestive failure of, A., 641.  
serum proteins in disease of, A., 642.  
chicken's, utilisation of proteoses by fibroblasts of, A., 1284.  
dog's, oxygen consumption of, A., 963.  
guinea-pig's, oxygen consumption of auricles of, A., 1068.  
Heat, chemical composition for production of, (P.), B., 405, 820, 867.  
Nernst theorem of, A., 21, 454.  
equation for high-temperature content of, A., 1081.  
exchange of, B., 627.  
material for, (P.), B., 84.  
flow of, in furnaces, B., 483.  
through granulated materials, B., 243, 627.  
transfer of, by convection, B., 323, 627, 819.  
in relation to fluid friction, B., 787, 1107.  
at high temperatures, (P.), B., 324.  
in stream-line flow, B., 323.  
use of mercury vapour for, B., 627.  
transmission of, to liquids flowing in pipes, B., 787.  
to oil in pipes, B., 403.  
liquid for, (P.), B., 84.  
latent, of refrigerants, A., 453.  
specific, from Raman effect data, A., 219.  
of elements of the eighth group, effect of temperature on, A., 217.  
of gases, determination of, A., 115, 219.  
at high pressures, A., 220.  
at high temperatures, A., 799, 905.  
of diatomic gases, A., 219, 328.  
of organic liquids, A., 905.  
of solids at high temperatures, A., 1195.  
at temperatures of liquid helium, A., 684.  
of saturated vapours at boiling point, A., 453.  
Heat capacity, measurement of, A., 1194.  
of organic compounds, A., 698.  
Heat effect, measurement of, A., 137.  
Heat exchangers, (P.), B., 2, 131, 164, 211, 292, 324, 372, 454, 483, 484, 485, 660, 787, 867, 916, 1060.  
design of, B., 1011.  
prevention of corrosion of, by water and steam, (P.), B., 452.  
composition for, (P.), B., 485.  
for gases, (P.), B., 916.  
for heating of gases, (P.), B., 1012.  
for liquids, (P.), B., 405.  
electric, B., 943.  
plate, (P.), B., 707.  
Heat exchangers, tubular, (P.), B., 211, 243, 452, 579, 755, 787, 1107.  
baffle packing for, (P.), B., 533.  
vertical, multiple connexion of, B., 755.  
Heat meters, (P.), B., 2.  
Heat of activation, kinetics of, A., 576.  
Heat of absorption, in relation to dielectric constant of adsorbed gas, A., 224.  
anomalous, A., 459.  
Heat of combustion, measurement of, A., 125.  
of mixtures of organic compounds, A., 1091.  
of halogen organic compounds, A., 812.  
Heat of dilution, measurement of, A., 1206.  
of bi-univalent salts, A., 23, 913.  
Heat of dissociation and the periodic law, A., 997.  
Heat of expansion of gases, A., 454.  
Heat of formation and atomic number, A., 469.  
and the  $M/N$  ratio, A., 698.  
Heat of sublimation, optical measurement of, A., 669.  
Heat of vaporisation of liquids, A., 790.  
latent, determination of, A., 115.  
Heat of wetting of adsorbents, A., 460.  
of powdered adsorbents, A., 333.  
Heaters, central, use of coke in, B., 295.  
Heating, pressure-temperature device for control of, (P.), B., 789.  
of decomposable materials, (P.), B., 531.  
of liquids, (P.), B., 2.  
with impure gases, (P.), B., 452.  
high-temperature, use of diphenyl compounds in, B., 627.  
indirect, of chemical apparatus, (P.), B., 1060, 1109\*.  
Heating apparatus, (P.), B., 85, 404, 787.  
structural materials for, B., 627.  
for liquids, (P.), B., 85, 1061.  
electric, ceramic plate for, (P.), B., 984.  
Hederagenin, constitution of, A., 1035.  
and its derivatives, A., 1140.  
derivatives of, A., 1035.  
Hederagonic acid, derivatives of, A., 749.  
Hedgehogs, fat of, A., 870.  
Hedragenin, and its derivatives, A., 1035.  
Hedragil lactone triacid, A., 1036.  
Hedragone, and its derivatives, and bromo-derivatives of, A., 1035.  
Heliotric acid, A., 865.  
Heliotridine, and its hydrochloride, A., 865.  
Heliotrine, and its methiodide, A., 865.  
*Heliotropium lasiocarpum*, alkaloids of, A., 865.  
Helium, atomic weight of, A., 4.  
atoms, ground state of, A., 787.  
excited, electron exchange in, A., 106.  
ionised, life of, A., 1.  
isotopes of, A., 442, 894.  
geochemistry of, in relation to radioactivity, A., 595.  
in oceanic alkali halides, A., 358.  
in petroleum beds, A., 594.  
separation of, from gases, (P.), B., 725.  
refraction and dispersion of, A., 323.  
spectrum of, A., 103, 1183.  
effect of canal rays and electric field on, A., 979.  
in electric and magnetic fields, A., 439.  
band spectrum of, A., 207.  
infra-red spectrum of, A., 207, 439, 1071.  
mass spectrum of, and its mixtures with oxygen, A., 894.  
continuous and line spectra in, A., 1071.  
spectrum of mixtures of neon and, A., 103.  
temperature variation of accommodation coefficient of, A., 316.  
Helium, passage of hydrogen canal rays through, A., 4.  
transformation of, into penetrating rays, A., 317.  
absorption of radiation from, A., 1185.  
critical potential of, A., 980.  
discharge potential of, in mercury vapour, A., 1073.  
excitation potentials of, A., 3.  
excitation processes in, A., 893.  
scattering of  $\alpha$ -particles by, A., 106, 107, 790, 1074.  
ionisation of, A., 2, 1185.  
formation of Aston's dark space in, A., 2.  
ions, mobility of, A., 106.  
mobility of positive alkali ions in, A., 670.  
motion of electrons in, A., 789, 893.  
scattering of electrons in, A., 106, 980, 1185.  
colour of light from high frequency discharges in, A., 1.  
liquid, measurements with, A., 453, 565, 683, 788, 799, 905.  
scattering of light by, A., 792.  
thermo-electric forces at temperatures of, A., 683.  
specific heat of, A., 1194.  
compressibility of, A., 1195.  
ignition voltage of, A., 237.  
solubility of, in liquid ammonia, A., 1197.  
matrix components for, A., 107.  
electrically excited, anomalous dispersion in, A., 1.  
analysis of, without using liquid air, A., 588.  
*Helix pomatia*, action of gastric enzymes of, on cellulose glycol ether, A., 304.  
glycogen and galactogen in, A., 415.  
Hemiaphyllene, A., 405.  
Hemicellulase, action of, on plant materials, A., 649.  
Hemicelluloses, A., 47.  
determination of, by oxidation with potassium dichromate, B., 836.  
in spent liquors from manufacture of alkali cellulose, B., 499.  
*Hemifusus tuba*, cleavage products of capsule proteins of, A., 76.  
Hemimorphite, crystal structure of, A., 987.  
Hemipinic acid, 5-bromo-, and mono- and di-chloro-, and their derivatives, A., 1047.  
Hemlock. See Coniine.  
Hemp, fertilisers for, B., 695.  
Canadian, oil from, B., 560.  
Hempseed oil, use of, in varnishes and in boiled oils, B., 31.  
Hendecamethylcellotriose, molecular weight of, A., 1117.  
Hendecamethyltriase, X-ray diagram of, A., 564.  
Heparin, effect of, on complement formation, A., 1273.  
on proteins, A., 870.  
determination of, A., 1054.  
Hepta-acetyldihydrodeoxyouabain, and its lactone derivatives, A., 856.  
Hepta-acetyl-4-glucosidomannose, A., 255.  
Hepta-acetyl-4-glucosidomethylmannoses, A., 255.  
Hepta-acetylsarcosine, ethyl ester cellobioside, and its hydrochloride, A., 605.  
Hepta-acetylsarcosylglycine, ethyl ester cellobioside, A., 605.  
Heptadecyl bromide, A., 717.  
*iso*Heptaldehyde semicarbazone, A., 363.  
Heptaldehydes,  $\alpha$ -hydroxy-, A., 145.  
Heptamethyl-3- $\beta$ -carboxyethylporphin, derivatives of, A., 173.  
Heptamethylenediphtalimide, A., 1238.

- Heptamethylsucrose, A., 603.  
 Heptane, Raman spectrum of, A., 1076.  
   equilibria of, with methylcyclohexane and its determination in petroleum, B., 632.  
   quenching of mercury radiation by, A., 325.  
   collision areas of, A., 563.  
 Heptane,  $\beta\delta$ -dibromo-, A., 606.  
 Spirocycloheptanes, diamino-, and their derivatives, A., 508.  
 d-Heptane- $\alpha\beta$ -diol, and its diphenylurethane, A., 144.  
 Heptan- $\delta$ -ol,  $\beta$ -bromo-, A., 606.  
 Heptenes, isomerisation of, A., 363.  
   quenching of mercury radiation by, A., 325.  
 $\Delta^a$ -Heptenonitriles, and their amides, A., 1119.  
 $\Delta^a$ -Heptenylhepto-*NN'*-diethylamidine,  $\alpha$ -chloro-, and its chloroplatinate, A., 371.  
 $\Delta^a$ -Heptinene, spectrochemistry of, A., 362.  
 $\Delta^a$ -Heptinene,  $\alpha$ -chloro-, A., 142.  
 Heptioic acid, *p*-halogenophenacyl esters, A., 744.  
 Heptioic acid,  $\epsilon$ -amino-, synthesis of, and its derivatives, A., 1239.  
    $\alpha$ -hydroxy-, configurative relationship of, to other  $\alpha$ -hydroxy-acids, A., 144.  
 l-Heptioic acid,  $\alpha$ -hydroxy-, barium salt, A., 144.  
 o-Heptoxybenzhydrylamine, and its hydrochloride, A., 52.  
 o-Heptoxybenzophenone, and its derivatives, A., 52.  
 n-Heptylamine,  $\eta$ -bromo-, action of alkali on, A., 1238.  
 Heptylidenehisdi-indone, A., 1252.  
 n-Heptylidenebisdimethyldihydroresorcinol, A., 1235.  
 n-Heptylmalonic acid, ethyl ester, A., 932.  
 N-2-cycloHeptylpiperazine, N-2-hydroxy-, and its salts, A., 1042.  
 Herba maté, absorption spectrum of, B., 1134.  
   absorption spectra of solutions of, as a means of detecting adulterants, B., 321.  
 Hessite, A., 595.  
 Heterocyclic compounds, relation between constitution, colour, and reactivity of, A., 623.  
   comparison of benzene with, A., 170.  
   absorption spectra of, A., 558.  
   berginisation of, A., 66.  
   action of ozone on, A., 1142.  
   behaviour of, in frogs, A., 189.  
   containing iodine, nitrogen, and oxygen, formation of, A., 1262.  
   six-membered, ultra-violet spectra of, A., 1262.  
 Heteropolarity, A., 1028, 1125, 1127.  
 Heusler's alloys, magneto-resistance of, A., 327.  
 Hevea in West Java, manuring of, B., 201.  
 Hexa-acetoxy-4:4'-dimethyldiphenyl, A., 854.  
 Hexa-acetyl-4-glucosidomannose, A., 255.  
 Hexa-acetylmercuriaurin, A., 410.  
 Hexa-(*dl*-alanyl)-*dl*-alanine, A., 503.  
 Hexabenzobenzene. See Coronene.  
 Hexadecahydrochrysene, A., 731.  
 Hexadecamethylene- $\alpha\omega$ -dicarboxylic acid,  $\omega$ -trimethylene ester, A., 601.  
 Hexadecane, equilibrium of, with octadecane, A., 468.  
 $\Delta^a$ -Hexadecenoic acid, A., 366.  
 Hexadecyl. See Cetyl.  
 n-Hexadienal, preparation of, and its compound with calcium chloride, A., 496.  
 $\Delta^{\beta\delta}$ -Hexadiene,  $\alpha\delta$ -dibromo-, action of, on magnesium ethyl bromide, A., 41.  
 cycloHexadiene, "dien"-syntheses with, A., 55.  
 Hexa- $\Delta^a$ -diene- $\Delta^{\gamma}$ -inene, and its hexabromide, A., 928.  
 Hexaethylgermane, A., 606.  
 Hexahedrite, Chilean, A., 1230.  
 Hexahydroartemesen, A., 271.  
 Hexahydroartemisinic acid, A., 271.  
 Hexahydroartemisins, A., 271.  
 Hexahydrobenzaldehyde semicarbazone, A., 44.  
 Hexahydrobenzene, equilibrium of, with benzene and hydrogen, A., 1203.  
 Hexahydrobenzoyl peroxide, A., 1128.  
 Hexahydro-2:3:8:9-dibenzocoronene-*B*-2-*B'*-2'-dicarboxylic acid, A., 732.  
 trans-Hexahydrohydrindene derivatives, effect of  $\alpha$ -methyl group on tautomerism of, A., 1032.  
 trans-Hexahydrohydrindenyl-2-acetic acid, derivatives of, A., 1033.  
 trans-Hexahydrohydrindyl-2-acetone semicarbazone, A., 1034.  
 trans-Hexahydrohydrindylidene-2-acetic acid, derivatives of, A., 1033.  
 trans-Hexahydrohydrindylidene-2-acetone, A., 1034.  
 trans-Hexahydrohydrindylidenehexahydro-2-hydrindone, oximes of, A., 1033.  
 Hexahydrophthalanilic acids, and their derivatives, A., 512.  
 Hexahydrophthalic acid, A., 512.  
 trans-Hexahydrophthalic acid, bromo-derivative, A., 1036.  
 Hexahydroisophthalimide, A., 753.  
 Hexahydrostrychnine, oxidation of, A., 178.  
 Hexahydrostrychnine, dibromo-, and its derivatives, A., 407.  
 Hexahydrovitamin-D<sub>2</sub>, derivatives of, A., 311.  
 n-Hexaldehyde, preparation of, and its cyanohydrin, A., 1119.  
 Hexaldehyde,  $\alpha$ -hydroxy-, dimeride of, A., 145.  
 Hexametaphosphates. See under Phosphorus.  
 2:3:4:3':4':5'-Hexamethoxy- $\omega$ -benzoylacetophenone, A., 621.  
 2:3:4:6:3':4'-Hexamethoxy-6'-methylchalcone, A., 388.  
 Hexamethylisobenzil dibenzoate. See  $\alpha\beta$ -Dibenzoyloxy- $\alpha\beta$ -dimesitylethylene.  
 Hexamethyldixylobionic acid, methyl ester, A., 44.  
 Hexamethylenetetramine (urotropine), A., 266.  
   photosynthesis of, A., 480.  
   co-ordination of, A., 726.  
   reactions of, with naphthols and phenols, A., 266.  
   with phenolic compounds, A., 946.  
   metallic compounds of, A., 1098.  
   complex iron cyanides of, A., 1009.  
   complex peroxides of, A., 371.  
   detection of, in preservatives for fish, B., 1005.  
 1:1':3:3':3':3'-Hexamethylindodicarbocyanine, 10-bromo-, 10-chloro-, and 10-nitro-, iodides of, A., 282.  
 1:2:3:4:5:6-Hexamethylpiperazines, and their salts, A., 755.  
 3:4:5:3':4':5'-Hexamethylpyrrocarbomethoxy-methane, A., 173.  
 3:4:5:3':4':5'-Hexamethylpyrrocarbomethoxy-methene hydrobromide, A., 173.  
 Hexamminetriiodicobaltic chloride. See under Cobalt.  
 n-Hexane, synthesis of, from n-propyl bromide, A., 1108.  
   interfacial tension of, against aqueous salt solutions, A., 1085.  
 Hexane,  $\beta\delta$ -dibromo-, A., 606.  
    $\beta\gamma\delta\epsilon$ -tetrahydroxy-, A., 835.  
    $\alpha$ -nitro- $\beta$ -hydroxy-, A., 1118.  
 cycloHexane, Raman spectrum of, A., 675.  
   vibration spectrum of, A., 7.  
   activated adsorption of, A., 688.  
   isomerisation of, to methylcyclopentane and dimethylcyclobutane, A., 938.  
   decomposition of, pyrogenically, A., 729.  
   Friedel-Crafts reaction with, A., 514.  
   and its homologues, production of  $\gamma$ -lactones of, (P.), B., 1055.  
   nitrosate, and its piperidine derivative, and nitrosite, A., 943.  
 cycloHexane, 1-amino-1-cyano-, hydrochloride, A., 862.  
   acetyl derivative, A., 256.  
   bromo-, chloro- and iodo-, electric moments of, A., 322.  
   1:4-dibromo-, and 1:4-diiodo-, crystal structure of, A., 451.  
   dihalogeno-derivatives, dipole moments and structure of, A., 322.  
   1:2:3:4-tetrahydroxy-, A., 835.  
   2-iodo-1-nitro- and 1-iodo-2-thioeyano-, A., 1120.  
 cycloHexanes, Raman spectra of, A., 213.  
 trans-cycloHexane-1-acetic acid-2-methyl ethyl ketone semicarbazone, A., 1033.  
 trans-cycloHexane-2-acetone-1-acetic acid semicarbazone, A., 1033.  
 trans-cycloHexane-2- $\gamma$ -carbethoxyacetone-1-acetic acid semicarbazone, A., 1032.  
 cycloHexanecarboxylamide, A., 44.  
 cycloHexanecarboxylic acid, electrolysis of, and its cyclohexyl ester, A., 737.  
 cycloHexane-1- $\alpha$ -cyanopropionic acid, 1-cyano-, ethyl ester, A., 614.  
 Hexane- $\alpha\beta$ -diol, A., 143.  
 cycloHexane-3:5-dione-1(2'-)-spirotrans-hexahydrohydrindene-2-carboxylic acid, ethyl ester, A., 1034.  
 cycloHexanespirocyclohexane-3:5-dione, derivatives of, A., 738.  
 cycloHexane-1-malonolactone, 1-hydroxy-, A., 614.  
 cycloHexanesulphonyl fluoride, A., 365.  
 $\Delta^a$ -Hexanoic acid,  $\alpha$ -cyano-, A., 372.  
 cycloHexanol, purification of, A., 996.  
   hydrogenation of, A., 378.  
 d- $\gamma$ -cycloHexan- $\alpha$ -ol, and its bromide, A., 1029.  
 cycloHexanols, 2-amino-, and their salts, A., 610.  
 isoHexan- $\delta$ -ol- $\beta$ -one (diacetone alcohol), manufacture of, (P.), B., 95.  
 cycloHexanone oxime, benzoyl derivative, A., 1133.  
 cycloHexanone, 2-chloro-, A., 1042.  
 cycloHexanones, orientation of, A., 67, 161.  
    $\alpha\alpha'$ -tetra-substituted, suppression of ketonic function of, A., 946.  
 $\alpha\alpha\beta\gamma\delta\delta$ -Hexaphenylbutadiene, A., 1024.  
 $\Delta^{\alpha\gamma\epsilon}$ -Hexatriene- $\alpha\zeta$ -dicarboxylic acid,  $\alpha$ -hydroxy-, acetyl and benzoyl derivatives, diethyl esters, A., 721.  
 $\Delta^{\beta}$ -Hexene,  $\alpha$ -chloro-, A., 610.  
 Hexenes, synthesis of, A., 361.  
 cycloHexene, reaction of, with arylamines, A., 1242.  
   with iodine and silver salts of monobasic acids, and its derivatives, A., 1120.  
 n-Hexenoamides, A., 372.  
 $\Delta^a$ -Hexenoamides, A., 258.  
 $\Delta^a$ -Hexenoic acid,  $\delta$ -chloro- $\gamma$ -hydroxy-, silver salt, A., 930.  
 Hexenoic acids, reaction of, with hypochlorous acid and ethyl hypochlorite, A., 930.  
 $\gamma$ - $\Delta^a$ -Hexenolactone,  $\delta$ -chloro-, A., 930.

*cyclo*Hexenones, trioximino-, and their salts and derivatives, A., 52.  
 Hexenonitriles, A., 372, 1119.  
 $\Delta^6$ -Hexenonitriles, A., 258.  
 $\Delta^6$ -Hexenylhexo-*NN'*-diethylamidine,  $\alpha$ -chloro-, and its chloroplatinate, A., 371.  
*iso*Hexoamidine, derivatives of, A., 756.  
 Hexodistearins, A., 364.  
 Hexoethylamide, A., 371.  
 Hexoic acid, acid potassium salt, A., 1018.  
*p*-chlorophenacyl ester, A., 744.  
 Hexoic acid,  $\epsilon$ -amino-, derivatives of, A., 601.  
 Hexoic acids, chloro- $\beta$ -hydroxy-, and their derivatives, A., 930.  
 $\alpha$ -Hexoic acid, glyceryl ester, and its *iso*-propylidene derivative, A., 364.  
*iso*Hexoic acid, *p*-iodophenacyl ester, A., 860.  
*p*-phenylphenacyl ester, A., 745.  
*cyclo*Hexoic acid, dithio-, *as*-phenylmethylhydrazide of, A., 51.  
 $\gamma$ -Hexolactones, chloro-, A., 930.  
*n*-Hexonitrile,  $\alpha$ -hydroxy-, A., 372.  
 Hexosans from starch, A., 724.  
 Hexoses, presence of hydroxymethylfurfuraldehyde in, A., 1020.  
 detection of, in urine, A., 186.  
 Hexose series, passage of, to cyclitol series, A., 834.  
 Hexosediphosphatedehydrogenase in plant seeds, A., 1062.  
 Hexosephosphates, determination of, in muscle, A., 199.  
 Hexosephosphoric acid, activation of, in red blood-cells, A., 74.  
 Hexosephosphoric acids in blood glycolysis, A., 956.  
 Hexoyl chloride, A., 142.  
*d*-*iso*Hexoyl chloride,  $\alpha$ -bromo-, A., 762.  
*dl*-*iso*Hexoylcysteine, methyl ester, A., 184.  
*d*-*iso*Hexoylglutathione,  $\alpha$ -bromo-, A., 762.  
*dl*-*iso*Hexoylglycine,  $\alpha$ -hydroxy-, A., 194.  
*dl*-*iso*Hexoylglycylglycine,  $\alpha$ -hydroxy-, A., 194.  
*l*-*iso*Hexoylglycylglycine,  $\alpha$ -bromo-, A., 1269.  
*iso*Hexoylglycyl-*dl*-leucinepyridonium betaine, A., 194.  
*dl*-*iso*Hexoyl-*dl*-leucylglycylglycine,  $\alpha$ -hydroxy-, A., 194.  
*l*-*iso*Hexoyl-*d*-leucylglycylglycine,  $\alpha$ -bromo-, A., 1269.  
 Hexoylphthalimide, A., 849.  
 Hexuronic acid, isolation of, A., 1235.  
 absorption spectrum of, A., 982.  
 oxidation-reduction potential of, A., 915.  
 crystal structure of, A., 987.  
 as antiscorbutic factor, A., 548, 886, 887.  
 identity of, with vitamin-C, A., 657.  
 Hexuronic acids, synthesis of, A., 367.  
 Hexyl perchlorate, A., 1120.  
*cyclo*Hexyl arsenite, A., 937.  
*cyclo*Hexylacetic acids, hydroxy-, ethyl esters, and their hydrazides, A., 848.  
 $\omega$ -*cyclo*Hexylalkylamines, preparation of, and their action with *Mycobacterium leprae*, A., 732.  
*n*-Hexylamine, quaternary methosulphate from, A., 149.  
*n*-Hexylamine,  $\zeta$ -bromo-, action of alkali on, A., 1238.  
*cyclo*Hexyl-*n*-amyl alcohols, and their bromides, A., 1028.  
*cyclo*Hexylamylidiethylamine, and its hydrochloride, A., 732.  
 $\epsilon$ -*cyclo*Hexylamyl-di-*n*-propylamine, and its hydrochloride, A., 732.  
*N*-*cyclo*Hexylaniline, derivatives of, A., 1242.

*o*-*cyclo*Hexylaniline, and its derivatives, A., 373.  
*p*-*cyclo*Hexylbenzonitrile, A., 373.  
*d*- $\beta$ -*cyclo*Hexylbutanes, A., 1028.  
 1- $\beta$ -*cyclo*Hexylbutyl alcohols, and their bromides, A., 1028.  
*cyclo*Hexyl-*n*-butylcarbinols, and their derivatives, A., 1027.  
 $\delta$ -*cyclo*Hexylbutyl-di-*n*-butylamine, and its hydrochloride, A., 732.  
*cyclo*Hexylbutyldiethylamine, and its hydrochloride, A., 732.  
 $\delta$ -*cyclo*Hexylbutyl-di-*n*-propylamine, and its hydrochloride, A., 732.  
 1- $\beta$ -*cyclo*Hexylbutyric acid, A., 1028.  
*cyclo*Hexyldiethylamine, and its hydrochloride, A., 732.  
*cyclo*Hexyl dimethylaminoethyl ketone, derivatives of, A., 1239.  
 $\alpha$ -*n*-Hexyl-*n*-eicosoic acid, A., 720.  
*cyclo*Hexylethylcarbinol, resolution of, and its strychnine hydrogen phthalate, A., 1027.  
*cyclo*Hexylethyl-diethylamine, and its hydrochloride, A., 732.  
*l*- $\gamma$ -*cyclo*Hexylheptanes, A., 1028.  
*d*- $\beta$ -*cyclo*Hexylheptic acid, A., 1029.  
*cyclo*Hexylhexanes, A., 1028.  
*l*- $\gamma$ -*cyclo*Hexylhexan- $\alpha$ -ol, and its bromide, A., 1028.  
 $\beta$ -*cyclo*Hexylhexoic acids, and their ethyl esters, A., 1028.  
*n*-Hexylidenebisdimethyl-dihydroresorcinol, A., 1235.  
*cyclo*Hexylidenebisthiolacetic acid, A., 1235.  
*cyclo*Hexylmethylcarbinol, and its resolution, and strychnine salt of hydrogen phthalate, A., 1027.  
 $\alpha$ -*cyclo*Hexylmethyl-ethylamine, and its salts and benzoyl derivative, A., 628.  
*cyclo*Hexyl-2-methyl-*cyclo*hexylamine, and its salts, A., 156.  
 $\delta$ -*cyclo*Hexyloctane, A., 1028.  
*n*-Hexyloxymethyl methyl and ethyl ethers, A., 1233.  
*l*- $\beta$ -*cyclo*Hexylpentane, A., 1028.  
*p*-Hexylphenol-2-sulphonic acid, salts of, A., 943.  
*cyclo*Hexylphenylsilicane diol, A., 1050.  
*cyclo*Hexylphenylsilicon dichloride, A., 1050.  
*N*-2-*cyclo*Hexylpiperazine, *N*-2-hydroxy-, and its salts, A., 1042.  
 1-*n*-Hexylpiperidine, and its salts, A., 48.  
*cyclo*Hexyl-*n*-propylcarbinol, resolution of, and its strychnine hydrogen phthalate, A., 1027.  
*cyclo*Hexylpropyldiethylamine, and its hydrochloride, A., 732.  
 2-*cyclo*Hexylpyrrolidine chloroaurate, A., 1259.  
 2-*cyclo*Hexylpyrrolidine, and its picrate, A., 1259.  
 Hexylresorcinol, preservation of foods with, B., 862.  
 3-*cyclo*Hexyltoluene, 4-amino-, and its derivatives, A., 1242.  
*N*-*cyclo*Hexyl-*p*-toluidine, and its derivatives, A., 1242.  
*cyclo*Hexylvaleric acids, and their ethyl esters, A., 1028.  
 Hibernation, biochemistry of, A., 772.  
 Hides, machines for working of, (P.), B., 652.  
 rotary-tool machines for working of, (P.), B., 521.  
 bating of, B., 904.  
 theory of, B., 393.  
 dehairing of, (P.), B., 1094.  
 preliminary hydration of, in relation to quality of heavy leathers, B., 810.

Hides, pickling of, B., 35.  
 swelling of, in relation to adsorption of hydrochloric acid, A., 122.  
 tanning of, (P.), B., 35, 565, 616, 742, 951, 1001.  
 use of sulphide lime liquors for sterilisation of, infected with anthrax, B., 238.  
 manufacture of sheet materials from fibres from, (P.), B., 121.  
 hairy, treatment of, (P.), B., 35.  
 Indian, "salt stains" on, B., 35.  
 South Indian, salt stains on, B., 564.  
 raw, salting of, B., 393, 810.  
 action of pancreatin on, B., 1000.  
 steer, use of amines in liming of, B., 273.  
 Hide powder, oak-bark extract tanned, fixed tannin and fixed water-soluble matter in, B., 780.  
*Hippoglossus hippoglossus*. See Halibut.  
 Hippulin, A., 547.  
 Hippuramide-*p*-arsinic acid, A., 180.  
 Hippuric acid, synthesis of, in dogs, A., 645.  
 influence of adrenaline and insulin on, A., 1292.  
*p*-arsenoxide, dichloride from, A., 180.  
 azlactone from, by action of 3-fluoro-4-methoxybenzaldehyde, A., 1130.  
 determination of, A., 1276.  
 Hippurylecysteine, methyl ester, A., 184.  
 Hirsutin chloride, synthesis of, A., 1140.  
 Histaminase, A., 92, 1166.  
 Histamine, influence of calcium on formation of wheals by, A., 648.  
 influence of narcotics on autolysis of, A., 1166.  
 effect of, on alkalireserve and blood-sugar in, A., 774.  
 on gaseous metabolism of isolated perfused dog's limbs, A., 966.  
 on nervous systems, A., 191.  
 substance resembling, in anaphylaxis of guinea-pigs, A., 966.  
 chloroaurates, A., 625.  
 spectro-analysis of histidine and, A., 1188.  
 detection of, A., 1150.  
 Histidine, isolation of, from proteins, A., 529.  
 ultra-violet absorption spectrum of, A., 792.  
 spectro-analysis of histamine and, A., 1188.  
 determination of, colorimetrically, A., 1270.  
*l*-Histidine, behaviour of, on fermentation, A., 778.  
 Histidine-*NN'*-disulphonic acid, and its potassium salt, A., 1023.  
 Histidylhistidine, titration constant of, A., 71.  
 Histidylhistidine-*NN'*-trisulphonic acid, and its potassium salt, A., 1023.  
 Histone, action of, in biology, A., 540.  
 Hiviscin, and its derivatives, A., 1296.  
*Hiviscus babdariffa*, red colouring matter of, A., 1296.  
*Holarrhena antidysenterica*, alkaloids of, A., 406.  
 Holly leaves, production of beverage and feeding-stuff from, (P.), B., 747.  
 $\beta$ -Homocacraldehydes, preparation of, A., 616.  
 $\beta$ -Homocamphor, homologues of, A., 1037.  
 $\beta$ -Homocamphor, oximino-, A., 399.  
 $\beta$ -Homocamphoric acid, A., 399.  
 $\beta$ -Homocamphoric acid, A., 399.  
 $\gamma$ -Homocholine, preparation of, A., 257.

- Homogentisic acid**, oxidation-reduction of, to benzoquinoneacetic acid, A., 1000.  
in serum, A., 767.  
synthetic, A., 767.  
determination of, in physiological fluids, A., 296.
- Homophthalic acid**, preparation of, by oxidation of indene, A., 613.
- Homomerides**, determination of configuration of, with racemic compounds, A., 239.
- Homomyristic acid**, and its derivatives, A., 843.
- Homoneurine series**, syntheses in, A., 1261.
- Homosopapaverine**, synthesis of, A., 628.
- Homophthalic anhydride**, derivatives of, A., 56.
- Homophthalimide**, condensation of, with o-aminobenzaldehyde, A., 1145.  
derivatives of, and oximino-, A., 624.
- Homophthalimide-4-azobenzene-p-sulphonic acid**, sodium salt, A., 624.
- Homophthalimide-4-azonaphthbionic acid**, sodium salt, A., 624.
- Homophthalimide-4-azonaphtholdisulphonic acids**, sodium salts, A., 624.
- Homophthalimide-4-azoprimuline**, A., 624.
- Homophthalimide-4-azo-m-xylene-o-sulphonic acid**, sodium salt, A., 624.
- Homopimanthrene**, A., 1254.
- dl-2-Homopiperidone**, 3-amino-, acetyl derivative, A., 624.
- Homopolar linkings**, thermal law of, A., 449.
- Homoretene**, A., 1254.
- Homothujacamphoraldehydecaboxylic acid**, and its derivatives, A., 948.
- Homothujacamporic acid**, diethyl ester, A., 948.
- Honey**, B., 815.  
relation of temperature to deterioration of, in storage, B., 815.  
moisture in top and bottom layers of, after storage for one year, B., 816.  
electrical conductivity of, B., 701.  
 $p_H$  of, B., 701.  
freezing point depression of, B., 46.  
crystallisation of, and effect of heating the crystallised product, B., 127.  
thixotropy of, B., 1053.  
pigmentation of, in relation to mineral constituents, A., 976.  
determination of colour of, B., 1134.  
deposits in, B., 749.  
origin of diastase in, B., 749.  
diastase value of, and detection of foreign honey by pollen analysis, B., 285.  
osmophilic yeasts in, and their relation to fermentation, B., 321.  
bioactivator for fermentation in, A., 306.  
Fiche's reaction with, B., 575.  
artificial, heated, and bees, comparison of, B., 285.  
comb, B., 46, 815.  
orange, detection of, B., 1103.  
d-rotatory, glucobiose and its derivatives in, A., 203.  
Victorian, mineral constituents of, B., 321.  
detection in, of invert sugar, B., 279.  
determination in, of moisture, B., 654.
- Hong Kong oil**, properties of, as affected by oil from Malayan *Aleurites montana*, B., 270.
- Hookworm disease**, plasma-proteins in, A., 1158.
- Hops**, aqueous extraction of, before use, B., 1132.  
production of extracts of, (P.), B., 44.  
experimental Linhart-type kiln for, B., 699.
- Hops**, relation between arsenic content of yeast and, B., 957.  
tannins in, B., 858.  
manuring of, B., 856.  
nitrogen manuring of, B., 856.  
preservative principles of, B., 746, 858.  
spraying of, with Bordeaux mixture, B., 570.  
antiseptic constituents of, B., 572.  
analysis of, A., 486; B., 43.
- Hordeine sulphate**, hyperglycæmic action of, A., 965.
- 8-Hormone**, and its benzoate, A., 1173.
- Hormones**, production of, (P.), B., 577, 961.  
evolution of, A., 1291.  
correlative relations of the organs producing, A., 780.  
manufacture of substitutes for, from coal, etc., (P.), B., 864.  
preparations of, from parathyroid glands, (P.), B., 449.  
action of, on plants, A., 547.  
adrenal cortex, A., 969.  
anterior pituitary, A., 780, 970.  
in castrated animals, A., 1172.  
in urine in endocrine disease, A., 1157.  
from urine of pregnancy, A., 97.  
action of, A., 308.  
on blood constituents, A., 432.  
thyroid-stimulating, A., 655.  
determination of, in blood, A., 885.  
circulatory, A., 432.  
Frey's, pharmacology of, A., 96.  
corpus luteum, A., 308, 971.  
evaluation of, A., 656.  
detection of, A., 547.  
female sexual, A., 781.  
occurrence and action of, A., 97.  
in unicellular animals, A., 199.  
female and male sexual, concomitance of, A., 1173.  
follicular, constitution and derivatives of, A., 781.  
from mare's urine, A., 1173.  
resistance of, to ageing, A., 308.  
action of, on plants, A., 1068.  
follicular and testicular, A., 96.  
chemical constitution of, A., 971.  
gonadotropic, A., 1173.  
purification of, A., 971.  
from urine, A., 885.  
growth of, plants, A., 549.  
heart, A., 432.  
male sexual, from urine, and their effect on birds, A., 309.  
standardisation of, A., 1293.  
determination of, A., 308.  
æstrus-producing, A., 199.  
ovarian, in urine, A., 199.  
ovarian follicular and posterior pituitary, antagonism of, A., 199.  
parathyroid, comparative pharmacology of calcinosis factor and, A., 1068.  
effect of, on calcium content of human milk, A., 655.  
pituitary, A., 432, 433, 546.  
in urine, A., 885.  
posterior pituitary, in blood in pregnancy, A., 970.  
melanophoric agent of, A., 970.  
detection of, in pregnancy, A., 536.  
prostate, production of, (P.), B., 864.  
secretory, from the stomach, A., 534.  
sex, A., 547.  
manufacture of, (P.), B., 80, 400.  
and carotenoids, A., 1068.  
in castrated animals, A., 1068.  
crystalline, from urine of pregnant mares, A., 433.
- Hormones**, sex, purification of extracts resembling, (P.), B., 207.  
spleen, A., 547, 1171.  
suprarenal cortex, A., 779.  
testicular, A., 781.  
effect of freshness of tissue on yield of, A., 655.  
assay of, A., 656, 1173.  
detection of, by changes in the pituitary, A., 971.  
thyroid, effect of coccus toxin on, A., 1171.  
fate of, in hyperthyroidectomy, A., 199.  
tissue, A., 972.
- Hormothyrin**, A., 655.
- Horn**, production of agglomerated products from, (P.), B., 238.  
artificial, production of, (P.), B., 360.  
ox, amino-acids in, A., 637.
- Horses**, steamed potato silage as feeding-stuff for, B., 1053.
- Horse-bean meal**, solubility of phosphorus compounds of, A., 1181.
- Horse fat**, B., 354, 735.
- Horse radish** (*Cochlearia amoralia*), distillation of, A., 60.
- Hortonolite-gabbro-diabases** of Siberian trap, A., 715.
- Hosiery**, mercerised cotton, faults in, B., 797.
- Humic acid**, constitution of, A., 253.  
adsorption by, B., 73, 569.  
stimulation of growth by, in relation to iron, B., 782.
- Humic acids**, determination of, in lignite, B., 758.
- Humic substances**, B., 919.
- Humidity**, measurement of, with thermocouples, A., 924.  
of raw materials for textiles, (P.), B., 460.  
control of, (P.), B., 582, 869.  
in air currents, A., 36.  
hair-type, A., 594.  
absolute and relative, relation of, B., 403.  
nomogram for conversion of, B., 323, 707.  
relative, A., 906.
- Humus**, chemical nature and origin of, B., 853.  
synthesis of "humus-nucleus" constituents of, A., 549.  
water-soluble, in relation to lake ore formation, A., 716.
- Hyacinth**, essential oil of, B., 48.  
water, use of products of, for power, B., 134.
- Hydantoins**, A., 862.
- Hydnocarpic acid**, Curtius reaction with, A., 375.  
salts of, and their solubilities, A., 511.  
manufacture of derivatives of, (P.), B., 128.
- Hydnocarpus**, oils from, in Malaya, B., 391.  
irritation caused by injection of iodised ethyl esters of, B., 128.
- Hydrargyllite**, in hydronephelinite, A., 1229.
- Hydrastinine**, synthesis of, A., 843.
- Hydrates**, structure of, A., 1079.  
formation of, in solution as evidenced by Raman effect, A., 213.  
surface chemistry of, A., 580.
- (+)-Hydratropaldehyde semicarbazone**, A., 736.
- Hydratropic acid**,  $\alpha$ -amino-, action of nitrous acid on amino-alcohols from, A., 382.

**Hydrazine**, formation of, in ammonia synthesis and decomposition, A., 581.  
mobility of ions of, A., 126.  
gaseous, photochemical decomposition of, A., 918.  
photochemical oxidation of, by ferri-cyanide, A., 348.  
condensation of, with pernitrosocamphor, A., 517.  
*polysulphide*, reaction of, with oleic acid, A., 832.  
*tetrathionate*, A., 823.  
additive compound of, with cellulose, A., 149.  
acyl derivatives of, A., 514.  
anhydrous, A., 351.  
detection of, A., 487.  
**Hydrazines**, analysis of, A., 1150.  
**1-Hydrazinoanthraquinone-2-sulphonic acid**, A., 265.  
**3-Hydrazino- $\beta$ -naphthoic acid**, and its derivatives, A., 847.  
**5-Hydrazino-1-phenyltetrazole**, and its derivatives, A., 1044.  
**5-Hydrazinotetrazole**, 1-amino-, and its derivatives, A., 172.  
**Hydrazoanisoles**, dihydrochlorides of, A., 155.  
**Hydrazobenzene**, dehydrogenation of, A., 377.  
hydrochlorides, and their hydrolysis, A., 155.  
**Hydrazobenzene**, 2:4:2':4'-*tetrabromo*-, and its diacetyl derivative, A., 1025.  
**Hydrazobenzene-*pp'*-distibinous oxide**, A., 867.  
**Hydrazobenzyl alcohols**, and their derivatives, A., 1243.  
**Hydrazo-compounds**, hydrolysis of salts of, A., 155.  
aromatic, reductive cleavage of, during rearrangement, A., 1244.  
**Hydrazodicarbonaminodiphenylene-*pp'*-distibinic acid**, A., 867.  
**Hydrazones**, basic properties of, A., 51, 609, 1132.  
condensation of, with aldehydes, A., 159.  
***o*-Hydrazophenol**, and its dibenzoyl derivative, A., 1243.  
***o*-Hydrazotoluene dihydrochloride**, and its hydrolysis, A., 155.  
**Hydrides**, crystalline, volumes of, A., 322.  
**Hydrindene**, 1-chloro-, A., 507.  
 **$\alpha$ -Hydrindone bromophenylhydrazones**, A., 169.  
oxime, benzoyl derivative, A., 1133.  
**2:1'-Hydrindylhydrind-1-one**, A., 507.  
**1:1'-Hydrindylindene**, A., 507.  
**Hydriodic acid**. See under Iodine.  
**Hydroaromatic compounds**, syntheses of, A., 55, 1144.  
Friedel-Crafts synthesis of, A., 44, 514.  
formation of aromatic compounds from, A., 735.  
**Hydrobromic acid**. See under Bromine.  
**Hydrocarbon**,  $C_{10}H_{16}$ , and its isomer, from carylamine, A., 948.  
 $C_{12}H_{20}$ , from reduction of hydrocarbon  $C_{10}H_{16}$ , from carylamine, A., 948.  
 $C_{12}H_{22}$ , from cyclohexyl chloride, aluminium chloride and cyclohexane, A., 50.  
 $C_{14}H_{22}$ , from ethylcarvone and magnesium ethyl bromide, A., 1139.  
 $C_{14}H_{26}$ , from cyclohexyl chloride, aluminium chloride and methylcyclohexane, A., 50.  
 $C_{15}H_{12}$ , from dehydration of  $\beta\gamma$ -diphenylpropane- $\alpha\beta$ -diol, A., 1246.  
 $C_{15}H_{20}$ , and its picrate, from dehydrogenation of  $\alpha$ -myrin benzoate, A., 1245.

**Hydrocarbon**,  $C_{16}H_{14}$ , and its derivatives, from dehydrogenation of strophanthidin, A., 948.  
 $C_{17}H_{20}$ , from isoamyl benzoate and benzene, A., 1240.  
 $C_{17}H_{32}$ , from naphthamine, A., 149.  
 $C_{18}H_{32}$ , from cyclohexyl chloride, aluminium chloride and cyclohexane, A., 50.  
 $C_{24}H_{20}$ , from pine tar, A., 943.  
 $C_{29}H_{46}$ , by distillation of acetylbenzocyclohexane, A., 856.  
 $C_{30}H_{48}$ , from dihydrobetulin and naphthalene-2-sulphonic acid, A., 750.  
 $C_{42}H_{26}$ , from preparation of rubrene, A., 261.  
 $C_{42}H_{46}$ , from diphenyl-( $\gamma$ -methyl- $\gamma$ -ethyl-2'-pentenyl)carbinol, A., 497.  
**Hydrocarbons**, configurative relationship of, A., 360.  
and their salts, formation of, by dehydrogenation of triterpenes, A., 517.  
preparation of, by reduction of fats, A., 249.  
synthesis of, catalytically, from mixtures of carbon monoxide and hydrogen, A., 141.  
manufacture of, (P.), B., 220.  
by destructive hydrogenation, (P.), B., 8.  
from acid sludge, etc., (P.), B., 93.  
from coal tars and oils, (P.), B., 634.  
by destructive hydrogenation of coal, tars, etc., (P.), B., 54.  
from sugar cane, (P.), B., 796.  
from phenolic tars, B., 87.  
purification of, (P.), B., 299, 925, 926, 971.  
by Edlecanu process, (P.), B., 588.  
refining of, (P.), B., 92, 669.  
separation of, from hydrogen, (P.), B., 1067.  
removal of phenols from, (P.), B., 10.  
removal of sulphur and its compounds from, (P.), B., 299.  
removal of sulphur compounds from, (P.), B., 925.  
treatment of, (P.), B., 413.  
apparatus for, (P.), B., 458.  
in the electric arc, (P.), B., 299.  
cracking of, (P.), B., 90, 217, 218, 411, 458, 491, 587, 712, 875, 876, 923, 970, 1068.  
apparatus for, (P.), B., 634, 1018.  
in presence of catalysts, (P.), B., 249.  
cracking and condensation of, B., 7.  
distillation of, (P.), B., 91, 492, 713, 1069.  
insoluble ground-joint lubricant for, A., 1227.  
distillation of material containing, (P.), B., 219.  
fractionation of, (P.), B., 91, 713.  
rectification of, (P.), B., 5.  
rectification and purification of vapours of, (P.), B., 220.  
rectification of complex mixtures of, B., 584.  
Raman spectra of, A., 675.  
action of cathode rays on, A., 40.  
vapour pressure and latent heat of vaporisation of, A., 685.  
pressure-temperature curves for, A., 1195.  
absorption and retention of, by solid fuels, B., 216.  
velocity of evolution of, from chloromagnesium phenylacetate and aliphatic magnesium compounds, A., 816.  
combustion of, A., 1001, 1106.  
slow combustion of, A., 25.  
inflammation of mixtures of air and, A., 1093.

**Hydrocarbon**, burners for, (P.), B., 11.  
conversion of, (P.), B., 458, 668, 712.  
into hydrocarbons of lower hydrogen content, (P.), B., 378.  
thermal decomposition of, (P.), B., 248.  
decomposition of, (P.), B., 411.  
in the glow discharge, A., 348.  
decomposition by heating of mixtures of water vapour and, (P.), B., 55.  
dehydrogenation of, (P.), B., 219.  
hydrogenation of, (P.), B., 669.  
with production of lubricating oils and lighter oils, (P.), B., 589.  
catalysts for high-pressure hydrogenation of, B., 297.  
oxidation of, B., 1070; (P.), B., 249, 344, 378, 635.  
formation of peroxides in, B., 535.  
partial oxidation of, in presence of oxides of nitrogen, B., 330.  
vapour-phase catalytic oxidation of, B., 927.  
working up of oxidation products of, (P.), B., 299.  
condensation of, by electric discharge, A., 479.  
reactions of, B., 327.  
carrying out of exothermic reactions on mixtures of, (P.), B., 219.  
relation between constitution and anti-knock value of, B., 585.  
production of carbon and hydrogen from, (P.), B., 492.  
manufacture of halogen derivatives of, (P.), B., 494.  
removal of, from aqueous halogen acids, (P.), B., 590.  
of high mol. wt., relation between viscosity and constitution of, A., 116.  
resembling camphor, A., 857, 1037.  
analysis of mixtures of, A., 495.  
determination of, in air, A., 631.  
in benzene, B., 8.  
**Hydrocarbons**, acetylenic, polymerisation and decomposition of, A., 717.  
removal of, from gases, (P.), B., 55.  
aliphatic, treatment of, (P.), B., 668.  
chlorination of, (P.), B., 878.  
conversion of, into higher hydrocarbons, (P.), B., 832.  
destructive oxidation of, (P.), B., 332.  
unsaturated, conversion of, into higher hydrocarbons, (P.), B., 877.  
allene and divinyl, velocity of polymerisation of, A., 232, 233.  
aromatic, formation of, from dienecarboxylic acids, A., 258.  
production of, (P.), B., 669.  
and their derivatives, (P.), B., 541.  
from phenols, (P.), B., 1072.  
by catalytic reduction of tar phenols, B., 326.  
acid sludge from refining of, B., 1065.  
infra-red absorption spectra of, A., 212.  
ultra-violet absorption spectra of, A., 319.  
hydrogenation of, at high pressure with nickel on kieselguhr as catalyst, B., 791.  
condensation of, with *o*-nitrobenzaldehydes, A., 169.  
manufacture of condensation products from, (P.), B., 95, 671.  
molecular compounds of, with sulphur dioxide, sulphuryl chloride, and thionyl chloride, A., 687.  
alkylated, synthesis of, A., 941.  
condensed, double linkings in, A., 608.  
polynuclear, A., 608, 731, 1024, 1123.  
determination of olefines and, B., 831.



**Hydrocarbons**, aromatic, determination of, in petroleum, B., 968.  
 benzene, production of, from low-temperature tar, (P.), B., 974.  
 bismesitylenic, ultra-violet absorption of, A., 940.  
 branched-chain, detection of, B., 493.  
 butadiene, manufacture of unimolecular reaction products of sulphur dioxide and, (P.), B., 301.  
 chlorinated, stabilisation of, (P.), B., 1019.  
 coloured, A., 507.  
 cracked, production of, (P.), B., 1069.  
 desulphurisation of, (P.), B., 92.  
 inhibition of gum formation of, (P.), B., 299.  
 cyclic, infra-red absorption spectra of, A., 792.  
 polymerisation of, A., 938.  
 heavy, production of light hydrocarbons from, by hydrogenation, (P.), B., 924.  
 ethylenic, formation of, from saturated acyclic hydrocarbons, A., 495.  
 ultra-violet absorption spectra of, A., 1074.  
*cis-trans*-isomerism in, A., 897.  
 hydrogenation of, A., 703.  
 formation of sulphur organic compounds from, A., 928.  
 ethylenic and paraffin, cracking of, B., 456.  
 gaseous, separation of, (P.), B., 971.  
 heat-treatment of, B., 919; (P.), B., 830, 926.  
 cracking of, B., 327.  
 refraction and dispersion of, A., 111.  
 production of alcohols, aldehydes, and acids from, B., 972.  
 production of hydrogen from, (P.), B., 328.  
 analysis of, A., 954; B., 585, 790.  
 gum. See Gum hydrocarbons.  
 halogenated, action of ultra-violet light on, A., 830.  
 action of magnesium on, in ethereal solution, A., 717.  
 heavy, conversion of, into lighter oils, (P.), B., 218.  
 high-boiling, conversion of, into lower boiling oils, (P.), B., 589.  
 higher, autoxidation of, B., 972.  
 analysis of, by condensation, A., 926.  
 hydroaromatic, decomposition of, A., 729.  
 light, production of, (P.), B., 458.  
 from heavy oils, etc., (P.), B., 55.  
 from oil shales, (P.), B., 875.  
 recovery or production of, (P.), B., 411.  
 liquid, formation of, from butenes, A., 250.  
 from ketones, A., 368.  
 manufacture of, from gaseous hydrocarbons, (P.), B., 330.  
 from methane, (P.), B., 249, 377.  
 by hydrogenation, (P.), B., 137, 459.  
 refining of, (P.), B., 492, 925.  
 under vacuum, (P.), B., 830.  
 removal of sulphur from, (P.), B., 92.  
 apparatus for electrical treatment of, (P.), B., 926.  
 cracking of, (P.), B., 90.  
 determination in, of traces of water, B., 872.  
 liquid and solid, pressure hydrogenation of, in the laboratory, B., 967, 1063.  
 hydration of, A., 1108.  
 long-chain, separation of, by fractional distillation in high vacuum, A., 927.

**Hydrocarbons**, low-boiling, production of, (P.), B., 137, 217.  
 apparatus for, (P.), B., 90.  
 refining of, (P.), B., 669.  
 removal of gum from, (P.), B., 587.  
 methane, catalytic chlorination and bromination of gases rich in, A., 347.  
 mixed, extraction of oxidation products from, (P.), B., 877.  
 nuclear, infra-red absorption spectra of, A., 445.  
 olefinic, polymerisation of, (P.), B., 172.  
 paraffin, physical constants of, A., 1231.  
 pressure-volume-temperature relations of, A., 684.  
 equilibrium between liquid and vapour solutions of, A., 696.  
 dew points of, B., 376.  
 conversion of, into acetylenes and ethylenes, (P.), B., 714.  
 oxidation of, by copper oxide, B., 215.  
 manufacture of motor fuel and viscous oils from, (P.), B., 926.  
 higher, conversion of, (P.), B., 589.  
 conversion products of, (P.), B., 714.  
 stereoisomeric, A., 597.  
 containing sulphur, conversion products from, (P.), B., 832.  
 petroleum, purification of, (P.), B., 588, 1018.  
 cracking of, (P.), B., 218, 1113.  
 catalytic dehydrogenation of, B., 53.  
 conversion of, (P.), B., 491.  
 decomposition of, (P.), B., 492.  
 production of acids and salts from, (P.), B., 494.  
 synthetic resins from, B., 1126.  
 stable mixtures of secondary alcohols and, (P.), B., 414.  
 polycyclic, aromatic, A., 153, 374, 747.  
 polynuclear, A., 1131, 1134.  
 saturated, gaseous, thermal conductivity of, A., 115.  
 unsaturated, manufacture of, (P.), B., 248, 330.  
 from waste rubber, (P.), B., 1093.  
 action of radon on, A., 141, 918.  
 oxidation of, by selenium dioxide, A., 1108.  
 gaseous, separation of, from gases, (P.), B., 926.  
**Hydrochloric acid**. See under Chlorine.  
**Hydrocholesteryl- $\alpha$ -cresol**, A., 511.  
**epiHydrocinchonidine**, and its chloride, A., 289.  
**epiHydrocinchonine**, and its salts, A., 289.  
**Hydrocinchoninone**, reduction of, A., 289.  
**Hydrocinnamylidenebisthiolacetic acid**, A., 1235.  
**Hydrocupreidine** alkyl ethers, and their hydrochlorides, A., 760.  
**Hydroelemonic acid**, bromo-, A., 397.  
**Hydro-extractors**, (P.), B., 868.  
 centrifugal, (P.), B., 933.  
**Hydroferriecyanic acid**, cadmium salt, double salts of, A., 1217.  
 potassium salt, preparation of, A., 580.  
**Hydroferrocyanic acid**, calcium salt, dispersion of, in electrolytic solutions, A., 998.  
 potassium salt, electrolytic oxidation of, (P.), B., 341.  
 action of formaldehyde on, A., 235.  
 detection of calcium by, A., 1223.  
 potassium and sodium salts, potentiometric titration of, A., 924.  
**Hydroferroisocyanic acid**, sodium salt, A., 728.  
**Hydrofluotitanic acid**. See under Titanium.

**Hydrofuramide**, reduction of, to tri-2-furfurylamine, A., 519.  
**Hydrogels**, A., 122.  
**Hydrogen**, atomic weight of, A., 4.  
 atoms, recombination of, A., 896.  
 reaction of active nitrogen and, at metallic surfaces, A., 129.  
 positively activated, reactivity of, A., 514.  
 atomic domain of, in crystals, A., 904.  
 nuclei of, in atom building, A., 556.  
 molecules, normal state of, A., 211.  
 cross-section of, in relation to slow protons, A., 554.  
 polarisability of, A., 791.  
 isotopes of, A., 442, 554, 790, 894.  
 from natural sources, A., 894.  
 in water from commercial cells, A., 894.  
 atomic weight of, A., 790, 1185.  
 in the solar chromosphere, A., 441.  
 formation of, from iron and water, A., 1007.  
 pure, preparation of, A., 495.  
 production of, B., 933; (P.), B., 248, 341, 422, 547, 678, 725, 884, 886.  
 Knowles plant for, B., 464.  
 catalytically, (P.), B., 936.  
 catalysts for, A., 578.  
 by water gas reaction, catalysts for, A., 235.  
 by electrolysis, B., 803.  
 electrolytically, with the Peckhartz electrolyser, B., 390.  
 by the iron-water vapour method, treatment of gases from, (P.), B., 103.  
 from hydrocarbons, (P.), B., 22, 248, 249, 330, 466, 492, 830, 1119.  
 from hydrocarbons other than methane, (P.), B., 981.  
 from gaseous hydrocarbons, (P.), B., 328.  
 from methane, B., 326.  
 from water, (P.), B., 547.  
 from water-gas, (P.), B., 600.  
 and carbon, (P.), B., 1112.  
 and its mixtures with carbon monoxide, (P.), B., 62, 600, 1066, 1067.  
 and methane, free from carbon monoxide, (P.), B., 136.  
 and nitrogen, (P.), B., 1029.  
 from ammonia, (P.), B., 1029.  
 from bituminous fuels, (P.), B., 103.  
 and oxygen, by electrolysis, B., 259.  
 production of gases rich in, (P.), B., 298.  
 from electrolysis of water, purification of, (P.), B., 261.  
 spectrum of, A., 103, 667.  
 in stars, A., 551.  
 Boltzmann distribution in band spectrum of, A., 891.  
 continuous and many-lined spectra of, A., 1.  
 resonance spectrum of, A., 787.  
 secondary spectrum of, A., 1071.  
 polarisation of light from canal rays of, A., 1185.  
 Doppler effects in canal rays of, A., 442.  
 reflexion of canal rays from, by solids, A., 893.  
 passage of canal rays of, through helium, A., 4.  
 Stark effect in, A., 979.  
 scattering of  $\alpha$ -particles by, A., 107, 790.  
 electron levels in, A., 787.  
 motion of electrons in, A., 789.  
 electron scattering in, A., 893.  
 spark potential in, A., 441.  
 ionisation of, by electron impact, A., 321.  
 negative ions in, A., 106.  
 electrodeless discharge in, A., 891.

**Hydrogen**, discharge tubes for, A., 1104.  
 streaming of, A., 894.  
 overvoltage of, A., 700.  
 at curved electrodes, A., 343.  
 on alloys, A., 472.  
 dissociation of, by excited xenon atoms, A., 1187.  
 heat of adsorption of, by platinum, A., 118.  
 by platinum black at 0°, A., 126.  
 constants of, A., 14.  
 and para-hydrogen, boiling point and vapour pressure curves of, A., 453.  
 isotherms of, A., 329.  
 and its mixtures with carbon monoxide, A., 116.  
 liquid and solid, thermo-electric force at temperatures of, A., 683.  
 solid, specific heats of, at helium temperatures, A., 219.  
 adsorption of, A., 331, 688.  
 and para-conversion, A., 569.  
 on metals, A., 569.  
 by charcoal, A., 568, 687.  
 by copper, A., 1199.  
 by iron and gold, A., 1199.  
 on nickel and platinum, A., 368, 688.  
 by palladium, A., 701.  
 by palladium-silver alloys, A., 16.  
 diffusion of, through palladium, A., 685, 906.  
 occlusion of, by palladium, A., 687.  
 by platinum black, A., 16.  
 equilibrium of, with chlorine at high temperatures, A., 695.  
 with palladium at 0°, A., 124.  
 solubility of, in liquid ammonia, A., 1197.  
 in water, A., 16, 687, 908.  
 co-ordination of, in associated liquids, A., 324.  
 flame temperatures of mixtures of air, methane, and, A., 127.  
 explosion of, with oxygen, A., 576, 701.  
 in soap bubbles, A., 815.  
 photosensitised explosion of mixtures of oxygen and, by chlorine, A., 479.  
 oxidation of, by copper oxide, B., 215.  
 catalytic oxidation of, A., 1004.  
 reduction by, A., 479.  
 detection of hydrogen atoms in reaction of chlorine and, A., 237.  
 velocity of sound in, at low temperatures, A., 13.  
 liberation of, from palladium, A., 28.  
 combination of, with ethylene, A., 815, 1095.  
 with oxygen on surface of silica, A., 25.  
 photochemical reactions of, with carbon monoxide and oxygen, A., 918.  
 action of, with chlorine, A., 1000.  
 on coal, B., 214.  
 with nitrous oxide, with platinum catalyst, A., 1213.  
 disappearance of, in presence of lithium and potassium ions, A., 892.  
 mixtures of carbon monoxide and, from heating of phosphates in hydrocarbons, (P.), B., 982.  
 introduction of, into glass by electrolysis, A., 230.  
**Hydrogen**, active, preparation of, A., 1215.  
 determination of, A., 709.  
 atomic, properties of, A., 127.  
 adsorption of, by films, A., 1084.  
 triatomic, A., 107, 1098.  
 compressed, physical properties of, A., 799.  
 molecular, two forms of, A., 113.  
 ionisation potential of, A., 788.  
 neutral, in canal rays, A., 554.

**Hydrogen**, ortho- and para-, equilibrium of, A., 912.  
 para-, conversion of, into ortho-hydrogen, A., 346.  
 on tungsten and nickel, A., 28.  
**Hydrogen bromide**. See Hydrobromic acid under Bromine.  
 chloride. See Hydrochloric acid under Chlorine.  
 halides. See Halogen hydrides.  
 polyhalides, A., 996.  
 iodide. See Hydriodic acid under Iodine.  
 peroxide, preparation of, A., 1098.  
 production of, (P.), B., 341.  
 purification of solutions of, by electrolysis, (P.), B., 260.  
 apparatus for electrolytic purification of, (P.), B., 514.  
 new form of, A., 1098.  
 photolysis of, in aqueous solution, A., 479, 918.  
 conductivity of aqueous mixtures of organic acids with, A., 1206.  
 velocity of decomposition of, A., 815.  
 decomposition of, by catalase, A., 880.  
 by iodine, A., 1212.  
 by traces of metallic salts, A., 128.  
 effect of azides on, by potassium iodide, A., 476.  
 catalytic decomposition of, by cadmium iodide, A., 346.  
 by iodine-iodide couple, A., 818.  
 by platinum black, A., 347.  
 oxidation of hydrogen bromide and chloride by, A., 703.  
 oxidation of hydrogen sulphide by, in presence of iron, A., 704.  
 photochemical reaction between hydrogen or carbon monoxide and, A., 479.  
 rôle of, in the Kolbe reaction, A., 348, 580.  
 reaction of, with potassium permanganate, A., 1094, 1210.  
 detection of, microchemically, A., 921.  
 determination of, in mixtures, A., 648.  
 volumetrically, in presence of alkali oxalates, A., 353, 486.  
 in bleaching baths, B., 336.  
 determination in, of active oxygen, B., 180.  
 selenide, action of, on acid chlorides, A., 382.  
 sulphide, pure, preparation of, A., 1218.  
 synthesis and decomposition of, by radon, A., 480.  
 production of, from hydrocarbons and sulphur, A., 578.  
 Raman effect and structure of, A., 320.  
 electrical conductivity of aqueous solutions of, A., 998.  
 liquid, reactions in, A., 1026.  
 vapour density of, A., 14.  
 absorption and evolution of, from solutions of sodium carbonate and arsenious oxide, A., 351.  
 absorbent for gas masks for protection against, (P.), B., 210.  
 solubility of, in water, A., 457.  
 phase study of mixtures of, with ammonia, A., 340.  
 equilibrium of, with carbon dioxide, A., 1218.  
 inflammability of mixtures of, with air, A., 473.  
 oxidation of, A., 344.  
 atmospheric oxidation of, A., 703.  
 removal of, from air, (P.), B., 466.  
 from coal gas, B., 214.  
 from fuel gas, (P.), B., 791.

**Hydrogen sulphide**, removal of, from gases, (P.), B., 9, 171, 248, 377, 491, 828, 922.  
 from mineral oils, (P.), B., 714.  
 from petroleum products, (P.), B., 830.  
 detection of, with lead paper, A., 354.  
 determination of, in industrial waters, B., 1106.  
 persulphides, reaction of, with organic compounds, A., 1026.  
**Hydrogen determination** :—  
 determination of, A., 410, 954.  
 by combustion, B., 825.  
 microchemically, A., 71, 72, 1051, 1149.  
 in coal gas, etc., B., 53.  
 in mixed gases, A., 488.  
 in mixtures with methane, ethane, and propane, A., 241.  
 in explosive liquids, A., 1051.  
 in organic analysis, A., 72, 867.  
**Hydrogen ions**, equivalent conductance of, A., 914.  
 mobility of, A., 342, 575.  
 exchange of, A., 570.  
 intracellular concentration of, A., 417.  
 photographic record of concentration of, A., 486.  
 recombination of, at metallic and oxidised nickel, A., 981.  
 reaction of, with hydroxyl ions, A., 473.  
 determination of, colorimetrically, A., 486.  
 standard solutions for, A., 135.  
 in solutions containing chlorine or hypochlorites, B., 1028.  
 electrometrically, A., 586; B., 431.  
 fluorometrically, A., 438.  
 apparatus for, A., 924.  
 neutral buffered standard for, A., 709.  
 standard buffer solutions for, (P.), B., 103.  
 chart for calculation from, A., 586.  
 automatic electrode for, B., 431.  
 automatic recorder for, A., 138, 828.  
 hydrogen effect in, A., 230, 586.  
 by antimony and manganese electrodes, A., 1220.  
 with glass electrodes, A., 1105.  
 with quinhydrone electrodes, A., 592.  
 with rotating electrodes, A., 135.  
 with the step photometer, A., 471.  
 in animal tissues, A., 638.  
 in blood with Winterstein's micro-electrode, A., 635.  
 in buffer solutions, A., 1000, 1220.  
 in gas-rich fluids, A., 486.  
 in solid media in bacteriology, A., 969.  
**Hydrogenation**, A., 944, 1120.  
 apparatus for, at high temperatures, (P.), B., 372.  
 catalysts for, (P.), B., 990.  
 at high pressure, B., 216.  
 in systems of amino-compounds, phosphate buffers and aldehydes, A., 1114.  
 of coals, tars, etc., apparatus for, (P.), B., 298.  
 of mineral oils, B., 666.  
 destructive, catalysts for, (P.), B., 299.  
 thallium compounds as, B., 295.  
**Hydrogenlyases**, A., 880.  
**Hydrology**, experimental, liposelection of cations in, A., 425.  
**Hydrolysis**, catalysts for, A., 1232.  
 acid, A., 498.  
**Hydromagnesite**, A., 595.  
**Hydrometers**, (P.), B., 663.  
 for liquids, (P.), B., 4.  
 floats for, (P.), B., 407.  
 with combined thermometer, correction table for, (P.), B., 708.  
 dry- and wet-bulb, basic law of, A., 491.  
**Hydonaphthalenes**, absorption spectra of, A., 211.

**Hydronephelinite**, composition of, A., 1229.  
**Hydrophthalides**, A., 269.  
*epi*-**Hydroquinidine**, and its salts, A., 290.  
*epi*-**Hydroquinine**, and its salts, A., 290.  
**Hydrotropic solutions**. See under **Solutions**.  
**Hydrotropy**, A., 687.  
**Hydroxides**, structure of, A., 1079.  
   electrometric precipitation of, A., 1092, 1207.  
   crystalline, decomposition pressures of, A., 573.  
**Hydroxonium ions**, existence of, A., 1075.  
**Hydroxy-acids**, equilibria of, with boric acid and water, A., 1204.  
   metallic complexes of, A., 269.  
   aromatic carboxylic, manufacture of arylamides of, (P.), B., 57.  
   fatty, manufacture of derivatives of, (P.), B., 792.  
   optically active, A., 720.  
   detection of, A., 954.  
 $\alpha$ -**Hydroxy-acids**, formation of, from cyanohydrins, A., 613.  
   action of acetone on amides of, A., 864.  
   cyclic. See *cyclo*Alkane-1-carboxylic acids, 1-hydroxy-.  
   fatty, oxidation of, A., 366.  
 $\alpha$ - and  $\beta$ -**Hydroxy-acids**, configuration of, A., 23.  
**Hydroxyacylamino-acids**, action of enzymes on, A., 194.  
**Hydroxy-aldehydes in solution**, A., 461.  
 $\alpha$ -**Hydroxy-aldehydes**, polymerisation of, A., 145.  
**Hydroxy-amines**, aliphatic, manufacture of, (P.), B., 138.  
**Hydroxy-carbonyl compounds**, A., 620.  
**Hydroxy-compounds**, aromatic, action of sulphites on, A., 264.  
 $\beta$ -**Hydroxy-esters**, dehydration of, A., 1110.  
**Hydroxy-ketones in solution**, A., 461.  
**Hydroxyl**, band spectrum of, A., 107.  
   electron affinity of, A., 791.  
   free, A., 820.  
**Hydroxyl ions**, mobility of, A., 1092.  
   reaction of, with hydrogen ions, A., 473.  
**Hydroxylamine**, formation of, from nitrites, A., 483.  
   velocity of reaction of, with ketones, A., 253.  
   oximes, aliphatic and terpenic, action of diazonium salts on, A., 750.  
   sulphate, reaction of, with sodium nitrite, A., 815.  
**Hydroxy-nitriles**, manufacture of, (P.), B., 173.  
   optically active, synthesis of, A., 967.  
 $\omega$ -**Hydroxy-sulphides**, reactivities of, A., 26.  
**Hydroxy-sulphones**, A., 156, 735.  
**Hygrometers**, (P.), B., 165.  
   uses of, in food industries, B., 579.  
**Hygrosopic substances**, open weighing of, A., 702.  
   microanalysis of, A., 921.  
*Hymenomyces*, soluble enzymes of, A., 195, 778.  
**Hymenoptera**, parasitic, respiration in larvæ of, A., 292.  
**Hyoscyamine**, determination of, in leaves of henbane and belladonna plants, B., 656.  
**Hyoscyamus**, assay of, B., 863.  
*Hyoscyamus niger*, alkaloidal content of, A., 99.  
**Hyperglycæmia**, effect of ergotamine on, during phosphorus poisoning, A., 424.  
   adrenaline, influence of protein amino-acids on, A., 1292.  
   effect of thyroxine, orasthin, and tonephin on, A., 546.

**Hyperindicaemia**, experimental, A., 297.  
**Hyperlipæmia**, reflex, A., 190.  
**Hypersensitiveness**, anaphylactic and tuberculin types of, A., 198.  
**Hypersthene**, from N. Carolina, A., 1228.  
**Hyperthyroidism**, iodine content of blood in, A., 1278.  
   sulphur and water in liver and brain in, A., 970.  
**Hypnotics**, action of, on decolorisation of methylene blue, A., 191.  
   barbituric acid, influence of structure on action of, A., 646.  
   toxicity of, A., 540.  
   synergised, containing magnesium, (P.), B., 1008.  
   determination of activity of, A., 301.  
**Hypoehloræmia**, A., 960.  
**Hypophysin**, action of, on salt and water metabolism, A., 432.  
   on water metabolism, A., 308.  
**Hypophysis**. See **Pituitary**.

## I.

**Ice**, manufacture of, B., 659; (P.), B., 453, 661.  
   apparatus for, (P.), B., 325, 372.  
   vapour pressure of, at low temperatures, A., 220.  
**Ice-cream**, production of, (P.), B., 447.  
   distribution of water in, B., 959.  
   utilisation of calcium and phosphorus in, A., 423.  
   fat content of, B., 525.  
   strawberry, B., 481.  
**Iceland spar**, dissociation of, A., 810.  
**Ichthosulphonic acid**, ammonium salt (*ichthamol*), determination in, of sulphur, B., 368.  
**Icterus**, skin pigmentation and urinary bile pigments in, A., 1158.  
**Igepon**, structure of solutions of, B., 849.  
**Ignition**, spontaneous, in relation to constitution, A., 1093.  
**Ilmenite** from Monte Roseo di Verra, A., 1106.  
   reduction of, B., 941.  
   in the gaseous phase, A., 1009.  
**Iminazole**. See **Glyoxaline**.  
**2-Iminazolone**, synthesis of, A., 1042.  
**2-Iminazolone-4-carboxylic acid**, synthesis of, and its derivatives, A., 1042.  
**Imino-acids**, dicarboxylic, preparation of, A., 49.  
**Imino-compounds**, aromatic, containing nitrogen, manufacture of, (P.), B., 174.  
**Imino-radicals**, free, A., 820.  
**Immune substances** in the new-born, A., 414.  
**Immunisation**, flocculation and protein changes in, A., 197.  
   with carbohydrate haptens on collodion particles, A., 636.  
   electrolytes in serum during, A., 196.  
**Immunity**, specific combination in, A., 184.  
   and enzymes, A., 187.  
   and lipins, A., 1153.  
   antipneumococic, of persons of different ages, A., 1170.  
**Immunology** for detection of biological relationships, A., 206.  
*Imperatoria ostruthium*, constituents of, A., 751.  
**Indanthrone dyes**, manufacture of, (P.), B., 333, 379.  
   vat, manufacture of, (P.), B., 58.  
**N-2-Indanylpiperazine**, N-1-hydroxy-, and its salts, A., 1042.

**Indazole**, arsenic derivatives of, A., 1268.  
**Indazole-6-arsenious disulphide**, A., 1268.  
**Indazolearsinic acids**, A., 1268.  
**Indazole-6-arsinoxide**, A., 1268.  
**Indazole-3-carboxylic acid**, 6-nitro-, and its ethyl ester, A., 760.  
**Indazole-6-thioarsinoxide**, A., 1268.  
**Indene**, ultra-violet absorption spectrum of, A., 896.  
   oxidation of, A., 613.  
   effect of, on alcoholic fermentation, A., 1167.  
**Indenes**, formation of, from aromatically substituted pinacols, A., 273.  
**Indican** in milk, A., 185.  
**Indicators**, A., 586.  
   use of, A., 33.  
   metallic electrodes as, A., 586.  
   effect of ultrasonic radiation on, A., 480.  
   demonstration of colour of, (P.), B., 869.  
   detection of colour changes in, in turbid or coloured media, A., 241.  
   for colorimetric determination of  $p_H$  of solutions containing chlorine, B., 1028.  
   acidimetric, A., 486.  
   use of, in argentometry, A., 922.  
   adsorption, A., 826.  
   for titration of halides, A., 1009.  
   basic, A., 921.  
   mixed, use of, in acidimetry, A., 921.  
   oxidation-reduction, A., 343.  
   precipitation, A., 813.  
   radioactive, A., 589, 1217.  
   reduction, A., 1102.  
**Indigo**, catalytic reduction of, (P.), B., 1020.  
   powdered, manufacture of, (P.), B., 1021.  
**Indigo blue**, preparation of, B., 14.  
**Indigo dyes**, manufacture of, (P.), B., 253, 497.  
   solubility of, in hydrocarbon oils, B., 253.  
   from phenanthraquinone, A., 753.  
**Indigosols**, manufacture of, (P.), B., 254.  
**Indigotin**, formation of, in von Baeyer synthesis, A., 625.  
**isoIndigotins**, chloro-, and their *leuco*-derivatives, A., 170.  
**Indium**, recovery of, from zinc ores, (P.), B., 1087.  
   superconductivity of, A., 683.  
   thermal conductivity of, at low temperatures, A., 684.  
   chemotherapy with, in trypanosomiasis and syphilis, A., 297.  
**Indium halides**, magnetic susceptibility of, A., 985.  
   trioxide, heat of formation of, A., 998.  
**Indole** in sewage, B., 369.  
   derivatives, Plancher rearrangement of, A., 287.  
   polycyclic, action of halogens on, A., 168, 1039.  
   detection of, colorimetrically, A., 868.  
**Indole**, 5:7-dinitro-2-amino-, A., 528.  
**Indoles**, nitro-, A., 402.  
   thiol-, A., 753.  
**Indole series**, action of nitrous acid on amines of, A., 1261.  
**Indolealdoxime acetate**, A., 1261.  
**3-Indoleazo-p-phenylstibinic acid**, and its salts, A., 954.  
**Indolenines**, A., 952, 1260.  
**isoIndolines**, preparation of, electrolytically, A., 1260.  
**Indoline dyes**, manufacture of, (P.), B., 222.  
**Indolizine**, and its picrate, A., 1145.  
**Indolizinecarboxylic acid**, A., 1145.  
**Indolizinecarboxylic acid**, derivatives of, A., 1145.  
**3-Indolylcarbinol**, and its acetyl derivative, A., 1261.

- Indones, A., 514.  
effect of, on alcoholic fermentation, A., 1167.
- Indophenine, A., 752.
- Indophenols, manufacture of, and blue sulphide dyes therefrom, (P.), B., 494.
- Indoquinoneanthrene, and its derivatives, A., 1136.
- Indotriazines, *mono-* and *di-*bromo-, 6-bromo-8-nitro-, 6-chloro-, and 6-nitro-3-amino-, A., 67.
- Indoxyl in milk, A., 295.
- $\psi$ -Indoxylspirocyclopentane, A., 168.
- Inertia, chemical, A., 1003.
- Infants, new-born, acid-base equilibrium of, A., 76.  
See also Children.
- Inflammation, A., 81, 1279.  
relation of acidosis to, A., 535.
- Ingots, moulds for casting of, (P.), B., 991.  
non-ferrous, moulds for casting of, B., 942.
- Injections, neutral solutions of complex metallic compounds for, (P.), B., 1008.
- Ink, manufacture of, (P.), B., 118.  
grinding mill for, (P.), B., 197.  
for marking on cellulose esters, (P.), B., 234.  
for intaglio printing, production of, (P.), B., 687.  
for photographic films, (P.), B., 818.  
for marking sausage casings, (P.), B., 1041.  
emulsified, (P.), B., 234.  
printing, (P.), B., 947, 997, 1041.  
base for, (P.), B., 518.  
removal of, from paper, (P.), B., 675.  
black, B., 271.  
analysis of, B., 1040.  
stamping, for wood pads, (P.), B., 948.  
transfer, (P.), B., 736.  
writing, (P.), B., 118.  
detection of additions of, to documents, B., 380.
- Inorganic compounds, diamagnetism of, A., 678, 1077.  
thermal dissociation of, A., 124, 468.  
solid, structure of, at high temperatures, A., 985.  
use of loretine in detection of, A., 1270.
- Inosic acid, preparation of, A., 1055, 1273.
- Inositol, detection of, A., 1270.
- Inositolphosphoric acid, ferric salt, compounds of, with ammonia and amines, A., 1127.
- Insanity, colloid chemistry of, A., 297.  
maniacal-depressive, bromine in blood in, A., 81.
- Insects, ash content of, A., 871.  
skeletal tissues in, A., 871.  
attraction of, by spray baits, B., 523.  
preparation for repelling, (P.), B., 578.  
toxicity of stomach poisons to, B., 570.
- Insecticides, B., 442, 523, 907, 908, 954; (P.), B., 202, 210, 277, 278, 524, 530, 571, 745, 962, 1048.  
manufacture of, (P.), B., 370, 1003, 1097.  
composition of "calcium fluosilicate" used as, B., 812.  
use of lecithin in emulsions for, B., 441.  
use of mineral oils in, B., 570.  
nitrogen heterocyclics as, B., 401.  
use of petroleum oils and oil emulsions as, B., 39.  
analysis of potash fish-oil soaps used in, B., 269.  
pyrethrum extracts as, B., 158, 783.  
rotenone as, B., 202.  
analysis of sulphur suspensions used as, B., 441.
- Insecticides, *Tephrosia macropoda* and tropical plants as, B., 698.  
waxes as carriers for, B., 812.  
waxed paper coated with, (P.), B., 596.  
for control of codling moths, B., 570.  
aliphatic thiocyanates as, B., 479.  
arsenical, adhesive strength of, B., 278.  
arsenical and fluorine, relative toxicity of, B., 812.  
contact, efficiency of, B., 441.  
determination of relative toxicity of, B., 39.  
*Leucothoe grayana* as, B., 698.  
rotenone and pyrethrins as, B., 1130.  
copper dust, adherence of, to foliage, B., 954.  
dust, adhesives and carriers for, B., 201.  
fumigant, stupefying action of, B., 202.  
lime-sulphur, factors affecting composition of, B., 277.  
liquid and dry, comparative oxidation rates of, B., 1130.  
solid, (P.), B., 125.  
spray, for trees, etc., B., 570.  
incompatibility of barium fluosilicate and nicotine sulphate in, B., 698.  
from petroleum oils, B., 812.  
mineral oil, toxicity of, to vegetation, B., 857.  
testing of, B., 322.
- Instruments, control, care and maintenance of, B., 1107.
- Insulating materials, progress in, B., 646.  
structure and electrical properties of, B., 390.  
waterproofing of, (P.), B., 1025.  
of rubber, electrical properties of, B., 1093.  
fireproofing composition for, (P.), B., 724.  
for hot or cold articles, (P.), B., 660.  
electrical, (P.), B., 115, 268, 433, 473, 804.  
manufacture of, (P.), B., 734, 1089.  
from cashew nut-shell oil, (P.), B., 900.  
from resins, (P.), B., 475.  
from rosin, (P.), B., 235.  
from rubber, (P.), B., 476.  
from rubber, balata, etc., (P.), B., 739.  
from regenerated rubber, (P.), B., 438.  
impregnation of, (P.), B., 945.  
manufacture of impregnated fabrics for, (P.), B., 28.  
enamels for use as, (P.), B., 24.  
flexible mica products for, (P.), B., 353.  
laminated wood product for, (P.), B., 889.  
manufacture of articles from, (P.), B., 734.  
for conductors, (P.), B., 993.  
cold-moulded, (P.), B., 614.  
flexible, manufacture of, (P.), B., 945.  
heat, B., 627; (P.), B., 343, 345, 485, 821.  
manufacture of, (P.), B., 964.  
thermal conductivity of, B., 963.  
for high-temperatures, B., 755.  
for lagging of boilers, tanks, etc., (P.), B., 1060.  
for packing, (P.), B., 628.  
porous, production of, (P.), B., 263.  
heat and sound, (P.), B., 244, 485, 628, 800, 985.  
formation of, on steel panels, etc., (P.), B., 455.  
sound, (P.), B., 727.  
production of, (P.), B., 985, 1025.
- Insulating blocks, binding agents for mineral wool for, (P.), B., 602.
- Insulating oils, (P.), B., 877.  
effect of heating in air on, B., 1112.  
changes in, in transformer boiling, B., 1065.
- Insulating tiles. See under Tiles.
- Insulating varnishes, application of, to metals, (P.), B., 518.
- Insulation, heat, (P.), B., 211.  
at high temperatures, B., 1107.
- Insulators, hydrocarbon oils as, (P.), B., 559.  
ceramic, mechanical and thermal shock tests on, B., 229.  
electrical, (P.), B., 390, 776.  
varnished fabric for, (P.), B., 115.  
glass, manufacture of, (P.), B., 263.  
for radio-frequency currents, (P.), B., 507.  
porcelain, manufacture of, (P.), B., 64.  
scuring of, to supports, etc., (P.), B., 115.  
modulus of elasticity as indication of uniformity of, B., 229.  
of rubber, etc., prevention of oxidation of, (P.), B., 237.  
refractory oxide, extrusion of, B., 548.  
solid, electric discharge in, A., 565.
- Insulin, A., 96.  
structure of, A., 1172.  
dimensions of particles of, A., 432.  
extraction of, A., 95.  
stimulation of pancreatic production of, by adrenaline, A., 431.  
purification and properties of, A., 780.  
effect of red and ultra-violet rays on, A., 1172.  
cataphoresis of, A., 1292.  
chemistry of, A., 886.  
action of ammonium hydroxide and of iodine on, A., 1292.  
secretion of, in hyperglycæmia, A., 432.  
action of, A., 431, 972.  
effect of digestive fluids on activity of, A., 655.  
effect of, on formation of blood-albumin, A., 886.  
on blood-sugar, A., 972, 1292.  
on formation of glycogen, A., 425.  
on pancreatic enzymes in malnutrition, A., 419.  
on phosphorus compounds in muscle, A., 972.  
and diet, on sugar dose test, A., 1157.  
on the eviscerated spinal animal, A., 96.  
inhalation of, in carbon dioxide atmosphere, A., 546.  
protection of, by antiproteases, A., 1067.  
resorption of, by bile acids and liver extract, A., 296.  
in relation to hyperglycæmia, A., 1172.  
specific antigen in, A., 1292.  
sensitivity of albino rats towards, A., 199.  
effect of treatment with glucose and, A., 546.  
crystalline, A., 972, 1292.  
acetylation of, A., 95.  
inactivation of, by cysteine and glutathione, A., 96.  
extra-pancreatic, in dogs after pancreatotomy, A., 655, 972.  
assay of preparations of, A., 972.
- Interfacial tension, double capillary measurement of, A., 492.
- Interferometer, ultrasonic, A., 335.
- Intermedin, A., 432.
- Intestinal juice, proteolytic enzymes of, A., 881.
- Intestines, adsorption of gases from, A., 426.

**Intestines**, resorption in, A., 644.  
 origin of aromatic poisons in, A., 295.  
 use of slimes from, as fertilisers, B., 395.  
 human, fate of cholesterol in, A., 1058, 1059.  
 rabbit's, lactic acid production in, A., 645.  
 small, contents of, after a fatty meal, A., 423.

**Inulan**, molecular weight and thermal degradation of, A., 836.

**Inulin**, A., 934.  
 structure of, A., 724, 1117.  
 molecular weight and thermal degradation of, A., 836.  
 determination of molecular weight of, cryoscopically, in liquid ammonia, A., 501.  
 acetylation and methylation of, A., 724, 725.  
 degradation of, thermally, to a fructose anhydride, A., 1022.  
 action of sodium triphenylmethyl on, in liquid ammonia, A., 934.  
 enzymic fission of, A., 543.  
 amorphous and crystalline, A., 149.

**Inulinase**, A., 934.

**Invar**, B., 891.

**Invertase**, ultra-violet inactivation of, A., 1165.  
 ultra-violet re-inactivation of, A., 1165.  
 measurement of activity of, B., 1101.  
 kinetics of action of, A., 775.  
 specificity of, A., 91, 775.  
 hydrolysis of sucrose solutions by, A., 193.  
 in blood after injection of sucrose, A., 293.  
 in horse blood-plasma, A., 1053.  
 in blood-serum or urine after injection of sucrose, A., 765.  
 from yeast, A., 91, 305, 967.  
 antigenic properties of, A., 414.  
 separation of, from  $\alpha$ -glucosidase, A., 1063.

**Iodic acid and Iodides**. See under Iodine.

**Iodination**, in liquid ammonia, A., 362.

**Iodine**, atomic weight of, A., 1073.  
 in air, A., 1106.  
 occurrence of, in foods and plants, and its determination, A., 1181.  
 in water, A., 594.  
 in water and coal, A., 249.  
 in Alberta water supplies, A., 1227.  
 circulation of, in nature, A., 1182.  
 extraction of, from aqueous solutions, (P.), B., 887.  
 from mineral waters, etc., (P.), B., 600.  
 recovery of traces of, from ashed samples, A., 1227.  
 from brine, (P.), B., 1079.  
 from iodine-containing activated carbon, (P.), B., 341.  
 wetting power of, from antiseptic solutions, B., 1135.  
 spectrum of, A., 1183.  
 absorption spectrum of, A., 315, 551.  
 in organic solutions, A., 674.  
 arc spectrum of, A., 787.  
 fluorescence spectrum of, A., 552, 668, 891.  
 resonance spectrum of, A., 552.  
 spark spectrum of, A., 103.  
 magnetic quenching of fluorescence of, A., 787, 1071.  
 calculation of vapour-pressure of, A., 684.  
 vapour, emission of glowing platinum in, A., 1072.  
 adsorption of, by agar agar and starch, A., 465.  
 by films of barium chloride, A., 17, 689.  
 solubility of, A., 124.  
 in aqueous salt solutions, A., 117.  
 in ethyl acetate, A., 222.

**Iodine**, solubility equilibria of, in aqueous solutions, A., 338.  
 therapeutic solution of, (P.), B., 1008.  
 solutions, behaviour of, at liquid-solid interfaces, B., 1135.  
 bactericidal efficiency of, B., 1054.  
 partition of, between carbon disulphide and water, A., 118, 803.  
 between kerosene and aqueous solutions, A., 223.  
 velocity of reaction of, with arsenious acid, A., 916.  
 decomposition of hydrogen peroxide by, A., 1212.  
 electrolytic oxidation of, A., 1096.  
 oxidation of, by iodine, A., 702.  
 reactions of, A., 585, 920.  
 action of, on marine waters, A., 1227.  
 with oxalates, A., 1210.  
 on platinum and tungsten, A., 128.  
 with silver perchlorate in organic media, A., 505.  
 with starch, A., 485.  
 salt-forming properties of, A., 809.  
 and "complete salt" prophylaxy, A., 82.  
 combination of, in molecular aggregates, A., 239.  
 value of, for livestock, A., 1162.  
 effect of, on metabolism, A., 423.  
 content of, in blood, A., 1285.  
 index of, for blood, A., 764.  
 absorption of, by the digestive tract, A., 880.  
 by the skin, A., 775.  
 excretion of, in urine, by goitrous and non-goitrous persons, A., 536.  
 effective dosage of, in exophthalmic goitre, A., 419.  
 in relation to goitre in Lettland, A., 419.  
 in relation to endemic goitre in New Zealand, A., 768.  
 toxicology of, A., 541.  
 evaluation of tincture of, B., 527.  
 fixation of, by tinctures as a method of their characterisation and evaluation, B., 622.  
 preparations for liberation of, on wounds, etc., (P.), B., 817.

**Iodine compounds**, influence of, on fertilisation, A., 1285.

**Iodine bromide and chloride**, heats of dissociation of, A., 319.  
 monochloride, preparation and properties of, A., 823.  
 predissociation in spectrum of, A., 791.  
 infra-red absorption spectrum of, A., 673.  
 in hydrochloric acid solution, A., 467.  
 energy, heat content and entropy of, A., 906.  
 nitrates, A., 912.  
 pentoxide, molecular volume of, A., 1190.  
 and its hydrates, pyrolysis, density, and heats of solution and hydration of, A., 470.

**Oxides**, formation of, in presence of sodium hydroxide, A., 127.

**Hydriodic acid**, mechanism of formation of, A., 347.  
 quantitative measurement of absorption spectrum of, A., 981.  
 electrolytic transport of water in solutions of, A., 698.  
 crystal structure of, A., 325.  
 effect of iodides on stability of, A., 474.  
 reduction of chlorates by, A., 1102.  
 action of, on highly insoluble compounds, A., 1219.  
 with persulphates, A., 384.  
 action of, on stannic oxide, A., 1100.

**Iodine:—**

**Iodides**, Raman spectra of, A., 1189.  
 structure of compounds of sulphur with, A., 114.  
 action of, with ferric salts, A., 702, 1002.  
 with lead acetate, A., 1011.  
 detection of, A., 1009.  
 colorimetrically, A., 824.  
 determination of, A., 241.  
 in presence of bromides and chlorides, A., 487.  
 in presence of reducing substances, A., 487.  
 potentiometrically, in presence of bromides and chlorides, A., 1009.

**Polyiodides**, compounds of, with benzonitrile, A., 1205.

**Iodic acid**, preparation and crystallography of, A., 352.  
 molecular volume of, A., 1190.  
 solubility and viscosity of, in aqueous mixtures of nitric acid, A., 568.  
 electrolytic oxidation of, A., 1096.

**Periodates**, potential of reduction of, to iodates, A., 813.

**Iodine organic compounds:—**

**Iodides**, organic, action of mercury on, A., 728.

**Iodine detection and determination:—**  
 detection of, in optical dissociation of salt vapours, A., 705.  
 determination of, microchemically, A., 241, 786.  
 in blood, A., 1272.  
 in coal, A., 241.  
 in cuprous iodide, B., 980.  
 in organic and biochemical material, A., 102.  
 in pharmaceutical preparations, B., 750.  
 in soils, B., 617.  
 in urine, by X-rays, A., 535.

**Iodoform**, crystal structure of, A., 1079.  
 oxidation of solutions of, A., 1215.  
 molecular compound of, with dioxan, A., 719.  
 sterilisation of, B., 1054.

**Iodonitro-compounds**, reduction of, A., 939.

**Ions**, mobility of, A., 442, 894.  
 in air, A., 317.  
 independent mobility of atoms and, in solids, A., 23.  
 transport numbers of, A., 1206.  
 electrical diffusion of, in charged gases, A., 670.  
 apparatus for production of known concentrations of, (P.), B., 1089.  
 periodic groups of, A., 901.  
 hydration of, A., 812.  
 in 0.1M solutions, A., 698.  
 interaction of, A., 894.  
 kinetics of reactions of, A., 233.  
 biological significance of, A., 877.  
 amphoteric and multivalent, behaviour of, in electrolytic solutions, A., 467.  
 atmospheric, large, mobilities of, A., 106.  
 gaseous, mobility of, A., 4.  
 in gases, A., 789.  
 of the heavier elements, hydration of, A., 813.  
 high-speed, heavy, production of, A., 106.  
 high-velocity positive, A., 209, 789.  
 light high-speed, production of, A., 554.  
 molecular, dissociation of, by collision, A., 670.  
 negative, formation of, A., 4, 106, 209.  
 emission of, under bombardment of positive ions, A., 4.  
 positive, ionisation by, A., 1073.  
 dissociation by collision with, A., 670.

**Ions**, positive, motion of, through gases, A., 4.  
 in glow discharges, mass of, A., 4.  
 high-velocity, A., 893.  
 solute, hydration of, A., 467.  
**Ionisation** from impact of electrons in air, A., 316.  
 mean field strength of, A., 793.  
 in pressure chambers, A., 208, 1225.  
 at high gas pressures, A., 669.  
 of adsorbed atoms, A., 208.  
 in gases, A., 553.  
 by electron impact, A., 321.  
 by ion collision, A., 893.  
 determination of, with X-rays, A., 113.  
**Ionisation constants** of acids in aqueous-alcoholic solutions, A., 912.  
**Ionium**, period of, A., 5.  
 $\alpha$ -rays of, A., 1074.  
 adsorption of, by manganese dioxide, A., 1199.  
 selective adsorption of, by manganese dioxide, A., 17.  
**Ionones**, compounds of, A., 852.  
*Ipecacuanha*, Indian, B., 863.  
*Ipomæa*, resin from, A., 665.  
*Ipomæa pandurata*, composition of, A., 784.  
**Iridium**, specific heat of, A., 13, 220.  
 m.p. of, A., 328.  
**Iridium organic compounds**:—  
 Iridium chloride, complex derivatives of, with organic sulphides, A., 1017.  
**Iridium alloys** with platinum, "stone test" on, B., 429.  
**Iridium determination and separation**:—  
 spectrographic analysis of, and its alloys, B., 266.  
 determination of, in ammonium chloroplatinates, A., 245.  
 and its separation from platinum, etc., A., 356.  
 and its separation from rhodium, A., 1224.  
**Iriscope**, Reade's, for determination of "wettability" of solids and liquids, A., 224.  
**Iron**, occurrence and determination of, in sea water, A., 923.  
 effect of alloy constituents on polymorphism of, A., 455.  
 manufacture of, (P.), B., 388, 682, 943.  
 pure, (P.), B., 388.  
 and its alloys, (P.), B., 230.  
 electric furnaces for, B., 938; (P.), B., 513.  
 use of coke-oven gas in, B., 758.  
 solid and gaseous fuels in, B., 582.  
 influence of slag constituents in, B., 773.  
 from its carbonyl, (P.), B., 472.  
 electrolytically, using a mercury cathode, (P.), B., 1124.  
 by reduction of ores with hydrogen, B., 890.  
 simultaneous production of Portland cement and, (P.), B., 470.  
 effect of increase in indirect reduction in blast furnaces for, on coal consumption, B., 346.  
 reactions in boshes and hearth of blast-furnaces for, B., 149.  
 reduction of manganese in, in blast-furnaces, B., 1033.  
 electrolytic extraction of slag and oxide inclusions from, B., 264.  
 purification of, (P.), B., 682.  
 cleaning of, (P.), B., 847, 1036.  
 and its alloys, removal of carbon from surface of, (P.), B., 67.

**Iron**, carburisation of, in cupolas, B., 843.  
 case-carburising and heat-treatment of, (P.), B., 471.  
 loss of carbon from, when heated in decarburising gases, B., 386.  
 case-hardening of, (P.), B., 67.  
 and its alloys, (P.), B., 388.  
 with nitrogen, (P.), B., 894.  
 cementation of, with silicon, B., 1083.  
 and its alloys, cementation and hardening of, (P.), B., 67.  
 and its alloys, heat-treatment of, to improve their yield point, (P.), B., 802.  
 melting of, (P.), B., 893.  
 in reverberatory furnaces, (P.), B., 682.  
 molten, diffusion of sulphur, manganese, phosphorus, silicon, and carbon through, B., 1120.  
 and its alloys, nitrogenisation of, B., 184; (P.), B., 683, 774, 802, 987.  
 scaling of, B., 938.  
 use of coke-oven gas in furnaces for smelting of, B., 488.  
 gas-permeability of blast-furnace charge in smelting of, B., 1120.  
 and its alloys, welding of, (P.), B., 943.  
 flux for, (P.), B., 981.  
 treatment for, (P.), B., 555.  
 electric arc, B., 430.  
 K-absorption spectrum of, A., 316.  
 K X-ray absorption spectrum of, A., 3.  
 infra-red arc spectra of, A., 1188.  
 vacuum arc spectrum of, A., 2.  
 scattering of X-rays by, A., 669.  
 photo-electric emissivity of, A., 669.  
 electrochemistry of, A., 813.  
 electrode potential of, A., 813.  
 time-potential curves for, A., 989.  
 potential difference between its sulphide and, A., 25.  
 contact potential difference between nickel and, and photo-electric effect, A., 8.  
 electrodeposition of, (P.), B., 991.  
 on worn parts, B., 846.  
 Kerr effect of thin layers of, A., 679.  
 magneto-optic effects through thin layers of, A., 678.  
 magnetic multiplets of, A., 1191.  
 and its alloys, magnetic properties of, A., 565, 795.  
 magnetic properties of, above the Curie point, A., 112, 216.  
 magnetic permeability of, A., 1080.  
 and its compounds, A., 448.  
 magnetic saturation of, A., 327.  
 influence of magnetic field on anodic behaviour of, A., 231.  
 permeability of, in high-frequency electromagnetic fields, A., 216.  
 change of magnetisation of, A., 987, 1192.  
 thermo-electric property of, A., 1192.  
 thermomagnetic effects in, A., 448, 900.  
 adsorption of ethylene and hydrogen by, A., 1199.  
 adsorption of gases by, A., 803.  
 solubility of, in mercury, A., 330.  
 solubility of nitrogen in, A., 918.  
 solubility of oxygen in, A., 22, 117.  
 crystals, electrical resistance of, A., 983.  
 equilibria in reduction, oxidation, and carbonisation of, A., 697, 811, 1205.  
 equilibria of, with carbon, A., 15, 339; B., 550.  
 and its oxides, with carbon and its oxides, A., 340, 574.  
 with hydrogen and oxygen, A., 1090.  
 with nickel and phosphorus, A., 221.

**Iron**, corrosion of, A., 27.  
 rate of, by aqua regia, A., 234.  
 in waterworks, B., 552.  
 effect of hydrogen sulphide on, by salt solutions, B., 1035.  
 prevention of, (P.), B., 111.  
 inhibitor for prevention of, by phosphoric acid, (P.), B., 188.  
 prevention of solvent action of sulphuric acid on, (P.), B., 188.  
 protection of, and its alloys, against corrosion, B., 728; (P.), B., 188.  
 in aerated saline solutions, B., 26.  
 by paint, B., 31.  
 microscopic forms of rust on, B., 508.  
 passivity of, A., 128, 343, 478, 1000, 1208.  
 rust-proofing of, (P.), B., 231, 1086.  
 paint for, (P.), B., 947.  
 and its alloys, B., 347; (P.), B., 67.  
 electroplating of, with brass, (P.), B., 351.  
 with chromium, (P.), B., 1124.  
 bronzing of, (P.), B., 111.  
 coating of, before rolling, etc., (P.), B., 1123.  
 and its alloys, with aluminium and its alloys, (P.), B., 231.  
 with chromium, (P.), B., 310.  
 with an organic salt of iron, (P.), B., 231.  
 with lead, (P.), B., 730, 803.  
 treatment of, prior to enamelling, (P.), B., 682.  
 enamels for, (P.), B., 68, 1032.  
 reactions in galvanising of, B., 800, 942.  
 pickling of, (P.), B., 802.  
 baths for, (P.), B., 943.  
 inhibitors for, (P.), B., 188.  
 electrolytic pickling of, B., 681.  
 theory of tinning of, B., 986.  
 and its alloys, nitriding of, B., 843, 890.  
 pure, action of molecular nitrogen on, B., 643.  
 action of water on, A., 1007.  
 molybdenum in, B., 469.  
 effect of oxygen in, B., 1082.  
 manufacture of food containers from, (P.), B., 894.  
 and its alloys, manufacture of powder from, (P.), B., 267.  
 co-activation of copper and, in chemistry and biology, A., 1182.  
 content of, in fruit and vegetables, A., 665.  
 distribution of, in plants, A., 1181.  
 deposition of medicinal preparations of, A., 90.  
 effect of, on blood formation, A., 1052.  
 content of, in blood-free tissues and viscera, A., 957.  
 in diet, A., 1283.  
 effect of deficiency of, in diet, A., 1283.  
 metabolism. See under Metabolism.  
 in normal and pathological tissues, A., 187.  
 accumulation of, in tuberculosis, A., 643.  
 requirement of, of pre-school children, A., 1060.  
**Iron**, cast, production of, in electric furnaces, B., 848.  
 growth of, B., 938.  
 undissolved graphite nuclei in, and effect of lead and zinc thereon, B., 939.  
 apparatus for refining of, (P.), B., 987.  
 improvement of, by alloying and heating, B., 230.  
 annealing and heat-treatment of, (P.), B., 111.

**Iron, cast**, volume changes in, during casting, B., 728.  
 reagents for etching of, B., 940.  
 nitrogen hardening of, B., 605.  
 welding of, with bronze, B., 386.  
 effect of work on bending strength of, B., 550.  
 mechanical properties of rolls of, B., 108.  
 corrosion of, by potassium and other alkali salt solutions, B., 985.  
 protection of, from corrosion, (P.), B., 350.  
 enamels for, (P.), B., 64.  
 acid-resisting enamels for, B., 306.  
 adherence of enamels to, B., 1030.  
 effect of chromium on, B., 1033.  
 polishing metallographic specimens of, B., 985.  
 separation of graphite in crystallisation of, B., 985.  
 manufacture of non-rusting articles from, (P.), B., 267.  
 alloys of, for use in paper manufacture, B., 680.  
 grey, superheating and heat-treatment of, B., 773.  
 effect of aluminium on viscosity of, B., 985.  
 exothermic phenomena at surface of, after corrosion by hydrochloric acid, B., 1036.  
 low-carbon, containing titanium, constitution of, B., 308.  
 malleable, effect of alloying elements on, B., 425.  
 whiteheart, effect of nickel and silicon on, B., 550.  
 molybdenum, mechanical and creep properties of, B., 26.  
 primary graphitisation of, B., 801.  
 nickel-chromium-silicon, B., 890.  
 wear-resistant, (P.), B., 350.  
 white, graphitising castings of, (P.), B., 150.  
 effect of chromium on, B., 386.  
 influence of manganese on graphitisation of, B., 508.  
 effect of molybdenum on graphitisation of, B., 26.  
 determination in, of sulphur, B., 425.  
 cast and pig, determination in, of silicon, B., 552, 939.  
 corrosion-resistant, (P.), B., 110.  
 electrolytic, manufacture of, B., 185.  
 effect of hydrogen content on hardness of, B., 265.  
 variation of potential of, A., 914.  
 adsorption of gases by, A., 458.  
 passivity of, in alkalis, A., 814.  
 ferrous, autoxidation of, A., 239.  
 galvanised, protection of, from "white rust," (P.), B., 987.  
 scrap, apparatus for treatment of, (P.), B., 847.  
 grey, effect of slag composition on structure of, B., 551.  
 hydrogenised, A., 324.  
 ingot, welding of, (P.), B., 683.  
 low-carbon, production of, (P.), B., 555.  
 malleable, manufacture of, (P.), B., 682.  
 casting of, (P.), B., 893.  
 meteoric. See Meteoric iron.  
 non-rusting, heat-treatment of, (P.), B., 894.  
 pig, ratio of scrap iron to, in open-hearth furnaces, B., 938.  
 desulphurisation of, B., 843.  
 low-carbon, desulphurisation of, (P.), B., 431.

**Iron, pig**, manganese, manufacture of, (P.), B., 1086.  
 synthetic, manufacture of, (P.), B., 470.  
 Thomas, desulphurisation of, B., 425.  
 powdered, manufacture of, from its carbonyl, (P.), B., 310.  
 pure and passive, diffraction of electrons by, A., 553.  
 pyrophoric, production of, (P.), B., 555.  
 sheet, enamels for, (P.), B., 983, 1031.  
 galvanising of, (P.), B., 512.  
 high-quality, annealing of, B., 426.  
 soft, corrosion of, A., 128.  
 sponge, production of, (P.), B., 350.  
 by the Norsk Staal process, B., 602.  
 concentration of, (P.), B., 987.  
 stainless, manufacture of, (P.), B., 388.  
 and its alloys, (P.), B., 774.  
 submerged, prevention of rusting of, (P.), B., 406.  
 ternary, detection of, with thiocyanates, A., 827.  
 wrought, production of, (P.), B., 987.  
 effects of inclusion streaks on tensile and dynamic properties of, B., 1082.  
 $\gamma$ - $\alpha$ -transformation in, B., 1082.  
**Iron alloys**, A., 117.  
 production of, (P.), B., 889.  
 treatment of, (P.), B., 267.  
 case-hardening of, (P.), B., 311.  
 oxy-acetylene welding of, B., 680.  
 magneto-resistance of, A., 327.  
 X-ray analysis of, B., 26.  
 coating of, with other metals, (P.), B., 682.  
 for construction of chemical plant, B., 1107.  
 for tools, etc., (P.), B., 730.  
 for cutting tools, (P.), B., 310.  
 containing carbide and sulphide, equilibria in, A., 1090.  
 austenitic, wrought, B., 1121.  
 chromium, cast, production of, (P.), B., 1122.  
 corrosion-resistant, B., 386; (P.), B., 231.  
 grey, effect of slag on structure of, B., 508.  
 stain-resistant, (P.), B., 350.  
 determination in, of chromium and vanadium, electrometrically, B., 149.  
**Iron alloys with alkaline-earth metals**, (P.), B., 310.  
 with aluminium, lattice structure of, A., 567, 685.  
 production of, (P.), B., 555.  
 resistance of, to oxidation, B., 680.  
 with aluminium and arsenic, for magnetic cores, etc., (P.), B., 1123.  
 with aluminium and chromium, heat-resistant, (P.), B., 847.  
 with aluminium and copper, A., 907.  
 with beryllium, A., 455.  
 with beryllium and tungsten, (P.), B., 609.  
 with boron, hardening of, B., 185, 552.  
 stainless, (P.), B., 988.  
 with carbon, effect of chromium on, B., 1035.  
 with carbon and cobalt, A., 1090.  
 with carbon and manganese, A., 686.  
 with carbon and silicon, equilibria of, A., 990.  
 with chromium, A., 221; B., 469.  
 production of, (P.), B., 802.  
 carbon-free, production of, B., 1035.  
 corrosion-resistant, (P.), B., 388.  
 malleable, manufacture of, (P.), B., 67.  
 with chromium and cobalt, B., 1035.

**Iron alloys with chromium and nickel**, B., 509; (P.), B., 988.  
 thermal expansion of, B., 309.  
 increasing strength of, (P.), B., 231.  
 passivity produced by chromic acid on, B., 66.  
 cast, tensile properties of, B., 1083.  
 with cobalt, hardening of, B., 940.  
 with cobalt and molybdenum, A., 801.  
 with cobalt and nickel, (P.), B., 310.  
 with cobalt and tungsten, A., 456.  
 with copper and nickel, electrodeposition of, from cyanide solution, B., 66.  
 with gold, magnetic properties of, A., 112.  
 with manganese, A., 455.  
 potential of, A., 1092.  
 with manganese and nickel, (P.), B., 1086.  
 with mercury, A., 456.  
 with mercury and tin, A., 456.  
 with mercury and zinc, A., 456.  
 with molybdenum, wrought, manufacture of, (P.), B., 683.  
 with nickel, B., 891.  
 change of austenite into martensite in, A., 907.  
 welding of, (P.), B., 683.  
 electrodeposition of, (P.), B., 896.  
 magnetic properties of single crystals of, A., 1193.  
 magnetostriction of, A., 13.  
 supercooling of, B., 680.  
 deoxidising agents for, (P.), B., 1086.  
 testing of, with an a.c. potentiometer, B., 774.  
 electrolytic, X-ray analysis of, A., 1196.  
 magnetic, (P.), B., 67, 189, 388, 471, 608, 609, 988.  
 for cores, etc., (P.), B., 683.  
 with nickel and copper, (P.), B., 189.  
 with nickel and tungsten, hot-hard, B., 644.  
 with palladium, A., 221.  
 with platinum, B., 554.  
 properties of, B., 554.  
 with silicon, acid-resisting, B., 1035.  
 with titanium, stainless, (P.), B., 988.  
 with tungsten, and their carbides, structure of, A., 1081.  
 with zirconium, A., 330.  
 See also Ferroberyllium, Ferrocerium, Ferrochromium, Ferromanganese, Ferronickel, Ferrophosphorus, Ferrosilicon, Ferrotitanium, Ferrotungsten, and Ferrovandium.  
**Steel**, structure of, A., 796.  
 austenite-martensite transition in, A., 1196.  
 segregation in, B., 386.  
 non-metallic inclusions in, B., 386, 1083.  
 and effect of zirconium, sodium, and calcium thereon, B., 309.  
 production of, (P.), B., 230, 388, 608, 682, 943.  
 by the Thomas process, B., 385.  
 sulphur balance in basic open-hearth process for, B., 843.  
 furnaces for, (P.), B., 893.  
 durability of lining and bottoms in Bessemer process for, B., 889.  
 electric furnaces for, B., 938; (P.), B., 513.  
 equilibria in, A., 340.  
 reaction of carbon with ferrous oxide in, A., 1211.  
 use of coke-oven gas in, B., 602, 758.  
 solid and gaseous fuels in, B., 582.  
 effect of burnt and unburnt lime on, in basic electric furnaces, B., 843.



**Iron alloys:—**

Steel, production of, manganese equilibrium in, in open-hearth furnaces, B., 468, 551.  
 manganese reduction in, B., 264.  
 changes in composition of slag and, during tapping from furnace to ladle and during casting in ingot mould, B., 603.  
 purification of, (P.), B., 189, 471.  
 in the Bessemer and open-hearth processes, (P.), B., 682.  
 purification of spent pickling liquors from, (P.), B., 341.  
 refining of, (P.), B., 803.  
 apparatus for, (P.), B., 987.  
 desulphurisation of, A., 125; B., 843.  
 electrolytic extraction of slag and oxide inclusions from, B., 264.  
 cleaning of, (P.), B., 847, 1086.  
 treatment of, (P.), B., 267.  
 heat-treatment of, (P.), B., 608.  
 electric furnaces for, B., 349.  
 internal stress produced by, B., 386.  
 annealing of, (P.), B., 555.  
 brazing of monel metal and, (P.), B., 683.  
 energising action of chemicals in carburisation of, with solid carburising agents, B., 184.  
 loss of carbon from, when heated in decarburising gases, B., 386.  
 case-carburising and heat treatment of, (P.), B., 471.  
 casting of, (P.), B., 110.  
 cementation and hardening of, (P.), B., 67.  
 caustic embrittlement of, B., 346.  
 behaviour of, in forging furnaces, B., 264.  
 hardening of, (P.), B., 388, 426, 551.  
 transformations in, B., 801.  
 heating of, for hardening, (P.), B., 388.  
 theory of hardening of, in relation to austenite-martensite transformation, B., 426.  
 and its alloys, effect of magnetic treatment on age-hardening of, B., 1034.  
 case-hardening of, (P.), B., 67.  
 and its alloys, (P.), B., 111.  
 abnormal behaviour in, B., 346.  
 with ammonia, (P.), B., 388.  
 with nitrogen, (P.), B., 188, 894.  
 in molten sodium cyanide, B., 843.  
 copper-plating for protected areas in, B., 843.  
 precipitation-hardening of, (P.), B., 683.  
 containing carbides, hardenability and annealing stability of, B., 939.  
 bonding of magnesite linings for melting furnaces for, B., 307.  
 quenching media for, B., 1082.  
 oils for quenching of, (P.), B., 589.  
 preparation for air-quenching of, (P.), B., 188.  
 tempering of, (P.), B., 1086.  
 welding of, (P.), B., 943.  
 flux for, (P.), B., 981.  
 production of wear-resisting surfaces on, by welding, (P.), B., 555.  
 flux and solder for welding of copper and, (P.), B., 894.  
 apparatus for testing mechanical properties of, (P.), B., 487, 608.  
 precipitation theory of hardness of, B., 1082.  
 strength of, at high temperatures, B., 1034.

**Iron alloys:—**

Steel, effect of cold-work before heat-treatment on tensile properties of, B., 469.  
 yield point and endurance of, at high temperatures, B., 680.  
 effect of zinc coatings on endurance properties of, B., 1121.  
 mechanism of breakdown of, B., 309.  
 increasing heat-resistance of, by alloying with chromium, nickel, aluminium, and silicon, B., 680.  
 increasing yield point and elongation of, (P.), B., 730.  
 physical properties of, after plastic and yield-point extension, B., 386.  
 time-potential curves of, A., 989.  
 solidification and crystallisation of ingots of, B., 940.  
 solution of, in acids, B., 108.  
 diffusion of admixtures into, A., 15.  
 equilibrium of, with carbon oxides, A., 811.  
 nitrogenisation of, (P.), B., 683, 774, 802, 987.  
 protection of, from corrosion, (P.), B., 350, 728.  
 against corrosion by coating with zinc or cadmium, B., 643.  
 effect of oxygen pressure on corrosion of, B., 1035.  
 rust proofing of, (P.), B., 67, 231.  
 durability of rust-preventive paints on, B., 71.  
 passivity of, A., 343, 478.  
 coating of, before rolling, etc., (P.), B., 1123.  
 with an organic salt of the metal, (P.), B., 231.  
 with lead, (P.), B., 803.  
 porosity of tin coatings on, B., 605.  
 electroplating of, with chromium, (P.), B., 1124.  
 for wear resistance, B., 349.  
 pickling of, (P.), B., 802.  
 baths for, (P.), B., 943.  
 inhibitors for, (P.), B., 188, 471, 509, 847, 894, 1086.  
 removal of scale from, by pickling, B., 1036.  
 bronzing of, (P.), B., 111.  
 enamels for, (P.), B., 1032.  
 treatment of, prior to enamelling, (P.), B., 682.  
 reagents for etching of, B., 940.  
 notched toughness on ageing and stress-line etching of, B., 551.  
 japanning of, B., 196.  
 preparation of, for painting, (P.), B., 894.  
 molybdenum in, B., 469.  
 for use at high temperatures, (P.), B., 608.  
 for machining, (P.), B., 67.  
 for permanent magnets, (P.), B., 151.  
 manufacture of abrasive material from, (P.), B., 267.  
 samples of, left by Faraday, B., 109.  
 potentiometric analysis of, B., 801.  
 detection in, of sulphides, megascopically, B., 265.  
 detection and determination in, of molybdenum, A., 590.  
 determination in, of beryllium, B., 427.  
 of carbon, magnetically, B., 469.  
 of chromium, manganese, and vanadium, A., 36.  
 of nickel, electrometrically, B., 430.  
 spectroscopically, of nickel, manganese, and chromium, B., 891.

**Iron alloys:—**

Steel, determination in, of non-metallic inclusions, B., 26.  
 of oxygen, by hot extraction, B., 1035.  
 by hydrogen reduction method, B., 1121.  
 of silicon, B., 1083.  
 of sulphur, B., 265, 425.  
 of tin, A., 712; B., 552.  
 of vanadium, B., 552, 1083.  
 Steel, alloy, (P.), B., 151\*, 471.  
 manufacture of, (P.), B., 470.  
 nitrogen case-hardening of, (P.), B., 1122.  
 oxy-acetylene welding of, B., 680.  
 tensile properties of, B., 1083.  
 with high creep limit, (P.), B., 189.  
 production of castings of, (P.), B., 67.  
 used in chemical engineering, B., 774.  
 for nitriding, (P.), B., 847.  
 for use in sulphite-pulp manufacture, B., 680.  
 non-rusting, magnetic, (P.), B., 988.  
 stable-surface, (P.), B., 988.  
 analysis of, B., 680.  
 determination in, of titanium, B., 1035.  
 of vanadium, B., 605.  
 aluminothermic, (P.), B., 512.  
 armour plate, production of, (P.), B., 471.  
 basic-hearth, changes in composition of, in foundry ladle, B., 985.  
 basic open hearth, production of, in Talbot furnaces in America, B., 508.  
 beryllium, (P.), B., 555.  
 containing boron, hardening of, B., 552.  
 carbon, growth of austenite above Acl in, B., 890.  
 quenched below A1 point, age-hardening of, B., 985.  
 heat-treatment of, in light of X-ray examination, B., 1035.  
 decarbonisation of, in salt baths, B., 427.  
 electrolytic extraction of manganese oxide and sulphide, iron sulphide and silica inclusions from, B., 265.  
 0.33% carbon, endurance limit of, B., 890.  
 high-carbon, martensite crystallisation in, B., 426.  
 low-carbon, heat-treated, structure of, B., 939.  
 carbon and high-speed, effect of cobalt on, B., 552.  
 case-hardened, influence of nickel on wear of, B., 551.  
 cast, welding of, (P.), B., 683.  
 inclusions in, B., 643.  
 mechanical properties of, at high temperatures, B., 1035.  
 tensile properties of, at low temperatures, B., 605.  
 hot strength of, B., 469.  
 cast or forged, turbine, strength of, at high temperatures, B., 185.  
 chromium, manufacture of, by Thomas process, (P.), B., 988.  
 working of, (P.), B., 608.  
 heat-treatment of, (P.), B., 471.  
 brazing flux for, (P.), B., 894.  
 corrosion-resistant, (P.), B., 1087.  
 heat-resistant, properties of, B., 387.  
 ledeburitic, forging and rolling of, B., 346.  
 magnet, heat-treatment of, B., 939.  
 rustless, (P.), B., 1122.  
 stainless, production of, (P.), B., 189.

## Iron alloys:—

Steel, chromium-aluminium, heat-resistant, B., 1121.  
 chromium-manganese, B., 1083.  
 chromium-nickel, (P.), B., 388.  
 manufacture of, (P.), B., 988.  
 heat-treatment of, B., 940.  
 precipitation-hardening of, by addition of boron, beryllium, or titanium, and its effect on corrosion resistance, B., 773.  
 dilatometric study of, B., 348.  
 acid-resisting, cold-rolled, corrosion of, B., 427.  
 corrosion-resistant, prevention of intergranular corrosion in, B., 680.  
 stainless, (P.), B., 1122.  
 production of articles from, (P.), B., 1086.  
 determination in, of chromium, B., 65.  
 chromium-vanadium, potentiometric analysis of, B., 185.  
 containing tungsten or molybdenum, creep of, B., 1083.  
 high-chromium, effect of silicon on transformation points and structure of, B., 427.  
 use of, in the chemical industry, B., 346.  
 high-chromium-nickel, austenitic, hardening of, B., 346.  
 cold drawn, effect of annealing on properties of, B., 551.  
 copper, heat-treatment of, (P.), B., 683.  
 corrosion-resistant, (P.), B., 110, 311.  
 antifriction, (P.), B., 894.  
 electro-, formation of gas bubbles in ingots of, B., 1083.  
 forged, unmachined, fatigue-resistance of, B., 1034.  
 forging, manganese and sulphur in, B., 509.  
 hardened, effect of magnetic fields on ageing of, B., 1034.  
 high-speed, effect of vanadium in, B., 643.  
 Izett, B., 508.  
 magnet, heat-treatment of, (P.), B., 1086.  
 magnet and high-speed tool, determination in, of cobalt, B., 728.  
 manganese, annealing of, (P.), B., 894.  
 welding of, (P.), B., 231.  
 welding rod for, (P.), B., 512.  
 nitrogenisation of, (P.), B., 609.  
 austenite, manufacture of articles from, (P.), B., 311.  
 forged and cast, mechanical properties of, B., 1035.  
 non-magnetic, (P.), B., 350.  
 strain-hardened, manufacture of castings of, (P.), B., 988.  
 manganese-chromium, production of stainless articles of, (P.), B., 189.  
 mild, effect of formation of cementite at grain boundaries of, on its properties, B., 264.  
 development of flow layers in, B., 346.  
 treatment of, (P.), B., 555.  
 electric welding of, B., 643.  
 surface hardening of, (P.), B., 683.  
 effect of ageing on stress-elongation curve of, B., 939.  
 corrosion of, A., 27.  
 and its alloys, by hydrogen sulphide at 500° C., B., 890.  
 action of sea-water on, B., 605.  
 manufacture of spring wire from, B., 551.

## Iron alloys:—

Steel, mild and chromium-nickel austenitic, corrosion-fatigue tests of, in River Tees water, B., 149.  
 molybdenum, ferromagnetic carbides in, B., 643.  
 nickel, case-hardening of, (P.), B., 67.  
 determination in, of nickel, electrographically, B., 1121.  
 nickel-chromium, (P.), B., 67.  
 for severe corrosion resistance, B., 508.  
 for chemical apparatus, (P.), B., 231.  
 for hot-working tools, (P.), B., 512.  
 nickel-plated, corrosion-fatigue tests on, in River Tees water, B., 1036.  
 nitrided, corrosion-fatigue tests on, in River Tees water, B., 1036.  
 nitrified, electrochemical potentials of, B., 643.  
 high-nitrogen, inhibition of formation of needles in, B., 603.  
 non-rusting, manufacture of, (P.), B., 682.  
 treatment of, (P.), B., 682.  
 cold-drawing of, (P.), B., 388.  
 heat-treatment of, (P.), B., 894.  
 hardening of, (P.), B., 987.  
 determination in, of chromium and vanadium, electrometrically, B., 149.  
 quick-drawn, determination in, of tungsten, B., 185.  
 rail, tensile properties of, at high temperatures, B., 604.  
 resistance to impact of, at high temperatures, B., 604.  
 rejected, B., 605.  
 rust- and acid-resistant, use of, in chemical engineering, B., 27.  
 self-hardening, determination in, of vanadium, B., 1083.  
 sheet, furnace for normalising of, (P.), B., 730.  
 cross-bending strength of enamels for, B., 306.  
 nickel-coated, (P.), B., 728.  
 silicon, production of, from silicon scrap, (P.), B., 1122.  
 for transformers, deoxidation in, B., 801.  
 properties of, B., 469.  
 treatment of sheets of, (P.), B., 1086.  
 manufacture of rolled sheets of, (P.), B., 1086.  
 determination in, of silicon, B., 552.  
 silicon-manganese, properties of, B., 605.  
 spring, B., 891.  
 stainless, B., 891.  
 production of, (P.), B., 774.  
 annealing and polishing of, (P.), B., 555.  
 welding of, (P.), B., 683.  
 pickling of, (P.), B., 555.  
 pickling solution for, (P.), B., 894.  
 ball bearings of, B., 643.  
 for chemical plant, B., 1083.  
 containing chromium, electroplating of, (P.), B., 232.  
 scrap, recovery of, (P.), B., 555.  
 structural, welding of, (P.), B., 471.  
 copper-chromium, manufacture of, (P.), B., 231.  
 tool, (P.), B., 608.  
 high-speed, annealing of, B., 108.  
 tungsten, formation of acicular ferrite in, B., 427.  
 tungsten magnet, crystal structure of, A., 797.  
 effect of heat treatment on lattice distortion and hardness of, A., 327.

## Iron alloys:—

Steel, vanadium, manufacture of, (P.), B., 350.  
 Steel articles, manufacture of, (P.), B., 988.  
 treatment of, (P.), B., 350.  
 with a high notched bar tenacity, (P.), B., 388.  
 chromium plating of, (P.), B., 68.  
 non-rusting, heat-treatment of, (P.), B., 682.  
 wear-resistant, production of, (P.), B., 231.  
 boiler plates, caustic embrittlement of, B., 386.  
 castings, production of, (P.), B., 608.  
 annealing of, B., 603.  
 firearms, composition for prevention of corrosion of, (P.), B., 1086.  
 ingots, production of, (P.), B., 1086.  
 properties of, in relation to method of production, B., 469.  
 casting of, (P.), B., 555.  
 moulds for, (P.), B., 1088.  
 in tilted moulds, (P.), B., 610.  
 solidification and crystallisation of, B., 426.  
 heterogeneity of, B., 604.  
 cast, manufacture of, (P.), B., 350.  
 sand-cast, heterogeneity of, B., 604.  
 knives, rustless and stainless, production of, (P.), B., 991.  
 products, rolled, manufacture of, (P.), B., 189.  
 rails, heat-treatment of, (P.), B., 189, 774.  
 sheets, cleaning of, (P.), B., 608.  
 annealing-covers for, (P.), B., 731.  
 heat-treatment of, (P.), B., 67.  
 coating of, (P.), B., 608.  
 strip or wire, heat-treatment of, (P.), B., 730.  
 wire, influence of pickling and galvanising on tensile properties of, B., 346.  
 annealed, elastic limit of, B., 643.  
 copper-coated, production of, (P.), B., 471.  
 works, use of coke-oven gas in, B., 1014.  
 tar for linings for converters in, B., 535.  
 Iron compounds, furnaces for reduction of, (P.), B., 27.  
 oxidation-reduction potentials of, A., 126.  
 catalytic action of, in culture media, A., 431.  
 and vitamin-B<sub>1</sub> in diet of children, A., 876.  
 complex, magnetism of, A., 10.  
 Iron salts, effect of, on blood regeneration, A., 79.  
 Iron chlorides, oxidation potentials of mixtures of, in hydrochloric acid solution, A., 472.  
 fluoberyllate, A., 583.  
 iodides, equilibria of, in aqueous solution, A., 808.  
 oxide, production of, from pyrites, (P.), B., 22.  
 phosphate, production of, from sludge of rust-proofing baths, (P.), B., 935.  
 aluminium phosphates, in Brazilian laterite, A., 1229.  
 silicates, equilibria of, with ferrous sulphide and with manganese silicate, A., 997.  
 sulphides, thermochemistry of, A., 812.  
 sulpho-salts, A., 1098.  
 Ferrie salts, peptisation of, by ferrie chloride, A., 571.

- Iron:—**
- Ferric salts, reduction of, by mercury, A., 35.**
    - reaction of, with iodides, A., 702, 1002.
    - determination of, iodometrically, A., 36.
  - Ferric arsenate, sols, coagulation of, A., 1202.**
  - Ferric chloride, production of, (P.), B., 383.**
    - crystal structure of, A., 986.
    - reduction of, by citric acid, malic acid, and sugars, A., 1006.
    - action of, with ethyl acetate, A., 719.
    - on silver, A., 1216.
    - anhydrous, absorption spectrum of, A., 982.
    - crystalline and gaseous, constitution and paramagnetism of, A., 679.
    - assay of tincture of, B., 750.
  - hydroxide, A., 585.**
    - structure of forms of, A., 134, 481.
    - adsorption of thorium-X by, A., 689.
    - precipitation of, in easily filtered form, A., 244.
    - colloidal, coagulation of, A., 571, 805.
    - effect of sera on flocculation of, A., 868.
    - peptisation of, by ferric chloride, A., 805.
    - by alkaline solutions of mannitol or sodium tartrate, A., 19.
    - hydrosols, coagulation of, A., 571.
    - sols,  $p_{H}$  of, A., 994.
    - displacement of equilibrium in, by heating, A., 226.
    - flocculation of, A., 462.
    - brown, structure and polymerisation of, A., 920.
  - Orthoferric hydroxide, ageing of, A., 805, 1216.**
  - Ferric oxide, forms of, A., 134.**
    - identification of varieties of, by their magnetic properties, A., 216.
    - heat treatment of  $\gamma$ -monohydrate of, A., 32.
    - comparison of red lead and, as rust preventives, B., 561.
    - use of, in rubber, B., 475.
    - colloidal, particle size and constitution of, A., 335, 463.
    - gels, equilibria of, with benzene, ethyl alcohol, and water, A., 697.
    - hydrosols, chloride-free, A., 461.
    - sols, migration in, A., 121.
    - ferromagnetic, A., 113, 133.
    - as biological indicator, A., 1086.
  - $\alpha$ -Ferric oxide, lattice constants of, A., 1079.**
  - Ferric phosphate, production of, from ferrophosphorus, (P.), B., 227.**
    - blue anhydrous, A., 1009.
  - Ferrosulfuric oxide, manufacture of sulphur dioxide and, from sulphide iron ores, (P.), B., 770.**
  - Ferrous ions, reduction of silver ions by, A., 1002.**
  - Ferrous chloride, activity coefficient of, A., 342.**
    - hydroxide, free energy of, from potential measurements, A., 339.
    - iodide as substitute for vitamin-A, A., 972.
    - oxide, equilibria of, with ferrosulfuric oxide, B., 1035.
    - with manganese, A., 125, 811.
    - with silicon dioxide, A., 997.
    - reaction of, with carbon, in steel, A., 1211.
    - determination of, in humus soils, B., 1046.
- Iron:—**
- Ferrous sulphate, action of X-rays on solutions of, A., 918.**
    - treatment of solutions of, with gases from roasting of sulphide ores, (P.), B., 533.
    - effect of sulphuric acid on atmospheric oxidation of, A., 476.
    - heptahydrate, equilibrium of, with cupric sulphate pentahydrate, A., 1198.
    - electrometric titration and properties of, A., 575.
    - detection of nitrogen dioxide by, A., 1221.
    - sulphide, equilibrium of, with iron silicate, A., 997.
  - Ferryl ions, A., 709.**
  - Iron organic compounds, colloid-complexes in, A., 468.**
  - Iron carbonyls, A., 134.**
    - and their reactions, A., 485.
    - compounds of, with *o*-phenanthroline, A., 920.
    - carbonyl halides, A., 134.
    - carbonyl hydride, formation of, A., 134.
    - pentacarbonyl, dielectric constant and dipole moment of, A., 322.
    - action of alkalis on, A., 32.
    - action of alkali alkoxides with, A., 485.
    - nitrosocarbonyl, A., 1219.
  - Iron detection, determination, and separation:—**
    - optical detection of removal of films from, A., 993.
    - detection of, colorimetrically, A., 182, 1103.
    - in starch, B., 1050.
    - in sulphuric acid, B., 419.
    - ferric, effect of neutral salts on iodide reaction for, A., 233.
    - determination of, with 5:7-dibromo-8-hydroxyquinoline, A., 490.
    - di-*o*-anisidine as internal indicator in dichromate method for, A., 244.
    - using basic mercuric bromate, A., 137.
    - electrometrically, B., 723.
    - iodometrically, A., 1224.
    - volumetrically, with chromous sulphate, A., 590.
    - in aluminium, A., 35; B., 802.
    - in blood. See under Blood.
    - in natural carbonates, B., 382.
    - in copper, B., 844.
    - in milk, B., 78.
    - in cow's milk and in human milk, A., 1276.
    - in organic substances, A., 1182.
    - in red lead, B., 195.
    - in presence of titanium, A., 712.
    - colorimetrically, in water, B., 50.
    - ferric and ferrous, A., 826.
    - determination in, of lead, B., 1119.
    - of tin, B., 552.
    - and its alloys, working up of filtrate from, of phosphorus, B., 347.
    - separation of, from aluminium, A., 1011.
    - from lead, A., 1223.
    - from thorium, A., 491.
  - Iron articles, cleaning of, by pickling, (P.), B., 802.**
    - coating of, with brass, (P.), B., 512.
  - Iron electrodes. See under Electrodes.**
  - Iron ingots, determination in, of copper, B., 890.**
  - Iron ores from Brazil, A., 492.**
    - from El Tofo, Chile, A., 596.
    - from Lake Superior, A., 596.
    - concentration of, in the Urals, B., 431.
- Iron ores, treatment of, (P.), B., 150, 1029.**
- behaviour of manganese in acid open-hearth treatment of, B., 602.
  - chloridising of, (P.), B., 894.
  - dressing of, B., 264, 1033.
  - roasting of, for reduction, B., 264.
  - reduction of, B., 938; (P.), B., 470, 730, 893, 942.
  - electrothermic reduction of, (P.), B., 987.
  - sintering of minette flue dust from, B., 107.
  - Canadian, dressing of, B., 602.
  - complex, roasting of, (P.), B., 893.
  - finely-divided, sintering of, (P.), B., 987.
  - Siegerland, roasting of, B., 889.
  - spathic, roasting of, A., 1009.
  - in externally fired shaft furnaces, B., 107.
  - sulphide, treatment of, (P.), B., 266.
  - chlorination of, with recovery of sulphur, (P.), B., 981.
  - production of iron oxide and sulphur dioxide from, (P.), B., 770.
  - containing copper and zinc, sulphatising roasting of, (P.), B., 152\*.
- Iron pipes, chromium-nickel protective coating for, (P.), B., 151.**
- galvanising of, (P.), B., 894.
  - pickling of, in sulphuric acid and sodium hydrogen sulphate solutions, B., 644.
- Iron powder, carbonyl, working of, by sintering, B., 1034.**
- Iron sheets, manufacture of, electrolytically, (P.), B., 610, 896.**
- adherence of enamels to, B., 1031.
  - for protection of archival documents against fire, (P.), B., 431.
  - phosphatised, durability of coatings on, B., 562.
- Iron tanks, lessening corrosion of, by sea water, (P.), B., 868.**
- Iron wire, effect of high-frequency fields on permeability of, A., 327.**
- galvanising of, (P.), B., 512.
- Iron works, fuel economy and control in, B., 167.**
- $\alpha$ -Iron, stretching of crystals of, A., 1193.
  - $\delta$ -Iron, solid solutions of carbon and, A., 15.
- Irradiated substances, distance- and contact-action of, A., 974.**
- Irradiation, metabolism produced by, A., 90.**
- Isatans, chloro-, A., 170.
  - Isatide, structure of, A., 951.
  - Isatides, chloro-, A., 169.
  - Isatin, condensation product of, with dibenzyl ketone, and its derivatives, A., 273.
  - dyes derived from, A., 67.
  - Isatin, chloro-derivatives, condensation of, with oxindole and dioxindole, A., 169.
  - 5:7-diiodo-, preparation of, A., 753.
  - 5:7-dinitro-, oxime, A., 528.
  - Isatin-*N*-acetic acid, bromo-, ethyl ester, A., 752.
  - Isatogens, A., 175, 941.
  - Isethionic acid, and its analogues and homologues, manufacture of, (P.), B., 1072.
  - Isoelectric points of ampholytes, determination of, A., 24.
  - Isomerides, stability and absorption spectra of, A., 505, 1245.
  - steric, differences in adsorption spectra of, A., 268.
  - Isomerism, binuclear, of diphenyl type, A., 402.
  - cis-trans*, kinetics of, A., 816.
  - and steric hindrance, A., 844.
  - dynamic, A., 846.

**Isoprene**, A., 249, 619.  
 preparation of, from rubber, A., 1108.  
 and caoutchouc, A., 1089.  
 Raman spectrum of, A., 1189.  
 polymerisation of, A., 361, 367, 830.  
 syntheses of terpenes from, A., 856.  
*cycloisoprenemyrene*, constitution of, A., 166.  
**Isotopes**, atomic weights of, A., 556.  
 structure of, A., 554.  
 displacement due to, and hyperfine structure, A., 668, 1072.  
 prediction of, A., 4.  
 effect of, on Raman spectra, A., 1188.  
**Istizin**. See **Anthraquinone**, 1:8-dihydroxy-.  
**Itaconic acid**, ethyl ester, reaction of, with sodium ethoxide, A., 1234.  
**Ivory**, waste, utilisation of, (P.), B., 476.

## J.

**Jacaré fat**. See **Caiman fat**.  
**Jacobine**, and its methiodide, A., 286.  
**Jacobsen reaction**, A., 607.  
**Jaconic acid**, A., 287.  
**Jacutinga**, auriferous deposits of, A., 829.  
**Jaeneckeite**, heat of formation of, A., 23.  
**Jams**, manufacture of, (P.), B., 447.  
 control of water content of, B., 1053.  
 fresh and dry plum, distinction between, B., 284.  
 determination of water in, B., 285.  
**Japanning** on concrete, (P.), B., 235.  
 of steel, B., 196.  
**Jatrorrhizubine**, A., 177.  
**Jaundice**, cholesterol of blood-plasma in, A., 1057.  
 produced by tolylenediamine, A., 766.  
 obstructive, sugar elimination in, A., 768.  
**Jellies**, manufacture of, (P.), B., 447, 662.  
 apparatus for determination of strength of, A., 247.  
 food, (P.), B., 1135.  
 inorganic, A., 806.  
 table, manufacture of, (P.), B., 1007.  
 pectin preparations for, (P.), B., 1053.  
 in divided blocks, (P.), B., 206.  
**Joaquinite**, A., 1228.  
**Joints (animal)**, changes in, produced by denervation, parathormone and vitamin-D, A., 1172.  
**Joints (mechanical)**, packing materials for, (P.), B., 1013.  
 for resisting high pressures, (P.), B., 165.  
**Joule-Thomson effect** in air, A., 220.  
**Juanite**, of Colorado, A., 1229.  
**Jute**, acid constituents of fibres of, A., 1177.  
 application of batching solution to, (P.), B., 978.

## K.

**Kaa-hé-é**, sweet principle of, A., 46, 313.  
**Kahweol**, and its derivatives, A., 975.  
**Kainite**, control of root crop pests with, B., 318.  
**Kaki fruit**, carotenoids from, A., 520.  
**Kale**, effect of seasonal temperatures on composition of, A., 99.  
**Potassium sulfoguaiaacoleum**, syrups prepared from, B., 527.  
 "Kalkammonphosphat," B., 74.  
**Kalopanax ricinifolius**, saponins of, A., 397.  
**Kalosapogenin**, and its derivatives, A., 397.  
**Kalosaponin**, A., 397.

**Kalotoxins**, A., 397.  
**Kamacite**, in Chilean hexahedrite, A., 1230.  
**Kanthal**, for electric resistances, B., 1083.  
**Kaolin**, formation of, in Polish Mittelgebirge, A., 829.  
 synthesis of, A., 716.  
 production of, (P.), B., 726.  
 properties of, B., 771.  
 effect of firing temperatures on, B., 548.  
 liquation of, by alkali, B., 305.  
 dehydration and rehydration of, A., 306.  
 suspensions, dispersoid chemistry of, A., 336.  
 production of products for weighting of paper, etc., from, (P.), B., 1079.  
 utilisation of residues from recovery of alumina from, B., 1118.  
 dehydrated, calorimetric investigation of, A., 230.  
**Kaolinite**, crystal structure of, A., 987.  
**Karitene**, A., 750.  
**Katadyn**, sterilisation of mineral waters with, B., 1053.  
**Kauri**, run, uniformity of, B., 153.  
**Kawa root**, constituents of, A., 748.  
**Kayu Baru**, bast fibre of, B., 176.  
**Kayu Selemoh**, bast fibre of, B., 176.  
**Kephalin**, A., 532, 533.  
 preparation of, A., 76.  
 brain, octabromides of unsaturated acids of, A., 1233.  
 human, A., 415.  
 octabromides of fatty acids from, A., 42.  
**Kerasin**, crystal, growth of, A., 1154.  
**Keratin**, constitution of, A., 184, 529, 867, 1148.  
 acid hydrolysis of, (P.), B., 565.  
 manufacture of gold compounds of degradation products of, (P.), B., 161.  
 feather, structure of, A., 1080, 1274.  
**Kernite**, crystal structure of, A., 451, 798.  
**Kerosene**, apparatus for production of, B., 1064.  
 refining of, B., 1016.  
 acid treatment of, B., 968.  
 conversion of, into lower-boiling hydrocarbons, (P.), B., 970.  
 distribution of iodine between aqueous solutions and, A., 223.  
 catalytic decomposition of, B., 135.  
**Kerr effect**, theory of, in wave mechanics, A., 111.  
 in relation to anisotropy and molecular structure, A., 794.  
 in high-frequency fields, A., 900.  
**Keten**, preparation of, A., 145, 932, 1019.  
 reaction products of, (P.), B., 973.  
 use of, in preparation of acid anhydrides, A., 1018.  
**Ketens**, formation of, from substituted amides, A., 849.  
**Ketamines**, nuclear synthesis of, A., 59.  
**12-Keto-3-acetoxycholanic acid**, and its semicarbazone, A., 1248.  
 **$\beta$ -Keto- $\alpha$ -acetyl- $\alpha$ -butyladipic acid**, ethyl ester, A., 1112.  
 **$\beta$ -Keto- $\alpha$ -acetyl- $\alpha$ -lauryladipic acid**, ethyl ester, A., 1112.  
 **$\delta$ -Ketoacetylmethyloleanolic acid**, and its derivatives, A., 1035.  
 **$\alpha$ -Keto-acids**, bornyl and menthyl esters, rotation of, A., 1253.  
 **$\beta$ -Ketoacidic acid**, A., 1247.  
 **$\alpha$ -Ketoacidic acid**,  $\alpha$ -hydroxy-, 2:4-dinitrophenylhydrazones, A., 1234.  
 **$\alpha$ -Keto-aldehydes**, A., 851.  
**1-Keto-3-(4'-amino-2'-methylphenyl)tetrahydrophthalazine**, and its acetyl derivative, A., 405.

**1-Keto-3-(4'-aminophenyl)-2':4-dimethyltetrahydrophthalazine**, A., 405.  
**2-Keto-4-aminophenyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acids**, ethyl esters, A., 1144.  
**2-Keto-4-anisyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acid**, ethyl ester, A., 1144.  
**4-Keto-1:3-benzodioxin**, and 6-bromo-, A., 949.  
**Ketobenzquinazocoline**, A., 66.  
 **$\alpha$ -Ketobutaldehyde**,  $\beta$ -chloro-, bromo-, and chloro-phenylhydrazones, A., 283.  
 **$\gamma$ -Ketobutanetetracarboxylic acids**, derivatives of, A., 254.  
 **$\gamma$ -Ketobutane- $\alpha\beta$ -tricarboxylic acid**, ethyl ester, reaction of, with ethyl chloroformate, A., 254.  
**allo-p-Ketocamphor**, manufacture of, (P.), B., 960.  
**1-Keto-3-(2'-chloro-4'-aminophenyl)-4-methyltetrahydrophthalazine**, and its derivatives, A., 284.  
**1-Keto-3-(2'-chloro-4'-aminophenyl)tetrahydrophthalazine**, and its derivatives, A., 284.  
**Ketochloroimines**, preparation of, A., 163, 853.  
**12-Ketocholanic acid**, and bromo-, A., 1131.  
**Ketocineol**,  $\alpha$ -bromo-, oximes of, and their derivatives, A., 619.  
**2-Keto-3-cyano-4-acetoxy-6-phenyl-2:3:4:5-tetrahydropyridine**, A., 522.  
**2-Keto-3-cyano-4-acetoxy-6-p-tolyl-2:3:4:5-tetrahydropyridine**, A., 522.  
**trans-2-Ketodecahydronaphthalene**, oximes of, and their benzoyl derivatives, A., 1133.  
**Keto- $\beta$ -deoxybilanic acid**, derivatives of, A., 1248.  
 **$\delta$ -Ketodiacetylhederagenin lactone**, dinitrodiacid from, A., 1036.  
**10-Keto-4:5:8:9-dibenzo-3-hydropyrene picrate**, A., 731.  
**Ketodibenzoyloxytrimethylenetriphenylmethanecarboxylic acid**, A., 271.  
 **$\delta$ -Keto- $\epsilon\epsilon$ -dibenzyl- $\beta\beta$ -dimethylhexoic acid**, A., 738.  
**4-Ketodihydroquinazoline**, 2-chloro-, reaction of, with aniline, A., 755.  
**1-Keto-6:7-dimethoxy-2:3-dimethyl-1:2:3:4-tetrahydronaphthalene**, A., 735.  
**2-Keto-4:6-dimethoxy-3-methylpyrimidine**, A., 404.  
**2-Keto-3':4'-dimethoxyphenyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acid**, ethyl ester, A., 1144.  
**1-Keto-6:7-dimethoxy-1:2:3:4-tetrahydronaphthalene**, and its derivatives, A., 735.  
**4-Keto-2:2-dimethyl-3:4-dihydro-1:3-benzometoxazine**, A., 865.  
**2-Keto-7:8-dimethyl-2:3-dihydrophenimidine**, A., 524.  
 **$\delta$ -Keto- $\beta\epsilon$ -dimethyl- $\beta$ -ethylheptoic acid**, and its semicarbazone, A., 738.  
**2-Keto- $\beta\zeta$ -dimethyl-4 $\alpha$ -heptadienyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acid**, ethyl ester, A., 1144.  
 **$\delta$ -Keto- $\beta\beta$ -dimethylheptoic acid**, and its derivatives, A., 738.  
 **$\delta$ -Keto- $\beta\beta$ -dimethyloctoic acid**, and its derivatives, A., 738.  
**2-Keto-4:6-dimethyl-1:2:3:4-pyrimidine-5-carboxylic acid**, ethyl ester, A., 1144.  
**4-Keto-2:2-dimethyl-1:2:3:4-tetrahydroacridine**, and its salts, and 6-nitro-, A., 403.  
**1-Keto-2:7-dimethyl-1:2:3:4-tetrahydronaphthalene**, and its semicarbazone, A., 603.

- 1-Keto-5:8-dimethyl-1:2:3:4-tetrahydronaphthalene, and its semicarbazone, A., 948.
- Ketodimethyl-1:2:3:4-tetrahydronaphthalenes, A., 278.
- 4-Keto-2:2-dimethyltetrahydro-oxazole, A., 865.
- 4-Keto-1:7-dimethyl-1:2:3:4-tetrahydrophenanthrene semicarbazone, A., 839.
- $\gamma$ -Keto- $\alpha$ -diphenyl- $\beta$ -benzyl-4<sup>a</sup>-butenoic acids, substituted, lactols and derivatives of, A., 1031.
- $\alpha$ -Ketodisopropylidenegluconic acid, potassium salt, oxidation of, A., 144.
- $\beta$ -Keto-esters, alcoholysis and hydrolysis of, A., 1020.
- enolic sodium derivatives, structure of, A., 254.
- Keto-ethylene oxides, reactions of, A., 859.
- $\beta$ -2-Keto-3:6-endoethylenecyclohexylpropionic acid, derivatives of, A., 938.
- 3-Keto-10-ethoxy-1:7-dimethyl-3:4:5:6:7:2-hexahydro-4-carboline, A., 288.
- 3-Keto-10-ethoxy-7-methyl-3:4:5:6:7:2-hexahydro-4-carboline, A., 288.
- 3-Keto-10-ethoxy-7-methyl-3:4:5:6-tetrahydro-4- $\beta$ -carboline, and its methosulphate, A., 288.
- 1-Keto-2-ethyl-1:2:3:4-tetrahydronaphthalene, and its semicarbazone, A., 734.
- 3-Keto-1-ethyl-1:2:3:4-tetrahydroquinoxaline, synthesis of, A., 170.
- 2-Keto-4-furyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acid, ethyl ester, A., 1144.
- $\delta$ -Ketohederageninlactone, and its derivatives, A., 1035.
- Ketohedragone di-acid, A., 1036.
- $\epsilon$ -Keto- $n$ -heptoic acid, preparation of, and its phenylhydrazones, A., 1230.
- $\alpha$ -Keto-4<sup>a</sup>-hexadiene- $\alpha$ -dicarboxylic acid, diethyl ester, and its derivatives, A., 721.
- $\gamma$ -Keto-4<sup>a</sup>-hexinodiethylamide, A., 727.
- 2-Keto-4-hexyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acid, ethyl ester, A., 1144.
- N-2-Ketocyclohexylpiperazine, and its derivatives, A., 404, 1042.
- $\alpha$ -Keto- $\gamma$ -hydroxybutaldehyde, osazone of, A., 497.
- 7-Keto-12-hydroxycholeic acid, A., 1131.
- 12-Keto-7-hydroxycholeic acid, and its lactone derivative, A., 1131.
- 2-Keto-4-hydroxy-3'-methoxyphenyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acid, ethyl ester, A., 1144.
- 1-Keto-2-hydroxymethylenetetrahydronaphthalene, and its derivatives, A., 863.
- Ketohydroxyestrin, structure of, and its derivatives, A., 1253.
- 2-Keto-mono- and -di-hydroxyphenyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acids, ethyl esters, A., 1144.
- 2-Keto-3':5'-diiodo-4'-hydroxyphenyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acid, ethyl ester, A., 1144.
- $\alpha$ -Keto- $\beta$ -methoxybutaldehyde, dichloro- $\beta$ -ethoxy- and -phenyl-osazones, A., 283.
- 8-Keto-10-methoxy-2:3-methylenedioxy-7:8-dihydroprotoberberine, and 9-hydroxy-, A., 177.
- 1-Keto-9-methoxy-7-methyl-1:2:3:4-tetrahydrophenanthrene, and its semicarbazone, A., 948.
- 4-Keto-1-methoxy-3-(4'-nitro-2'-methylphenyl)-3:4-dihydrophenanthrene, A., 405.
- 5-Keto-2-methoxy-5:6:7:8-tetrahydronaphthalene, and its semicarbazone, A., 1122.
- $\alpha$ -Keto- $\beta$ -methylbutyric acid, phenylhydrazones and  $p$ -ethoxyphenylhydrazones, A., 287.
- 2-Keto-3':4'-methylenedioxyphenyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acid, ethyl ester, A., 1144.
- Ketomethylenephenyldiphenylenemethane, A., 1032.
- $\alpha$ -Ketomethylcyclohexane-1:1-diacetic acids, and their derivatives, A., 741.
- $\delta$ -Ketomethyloleanic acid, A., 1035.
- $\alpha$ -Keto-3-methylcyclopentane-1:1-diacetic acid, and its derivatives, A., 740.
- 4-Keto-1-methyl-7-isopropyl-1:2:3:4-tetrahydrophenanthrene, A., 839.
- 4-Keto-3-methyl-1:2:3:4-tetrahydrophenanthrene, A., 608.
- 4-Keto-7-methyl-1:2:3:4-tetrahydrophenanthrene, A., 839.
- 2-Keto-6-methyl-1:2:3:4-tetrahydropyrimidine-5-carboxylic acid, ethyl ester, A., 1144.
- Ketomorpholine derivatives, A., 1145.
- 1-Ketomystic acid, and its oxime, A., 721.
- Ketone, C<sub>8</sub>H<sub>14</sub>O, and its semicarbazone, from oxidation of 1:2-dimethylcyclohexane, A., 837.
- C<sub>30</sub>H<sub>50</sub>O<sub>2</sub>, from oxidation of dihydrobetulin, A., 1138.
- Ketones, formation of, by isomerisation of aldehydes, A., 387.
- by dehydration of ethyl ethers, A., 831.
- synthesis and crystal spacings of, A., 250.
- nuclear synthesis of, A., 59.
- manufacture of, from olefin oxides, (P.), B., 12.
- recovery of, from shale oil, etc., (P.), B., 973.
- absorption spectra of, A., 272.
- dipole moments of, A., 8.
- velocity of reaction of, compared with that of hydroxylamine, A., 253.
- chlorination of, electrochemically, A., 853.
- hydrolysis of, A., 853.
- oxidation of, by selenium dioxide, A., 833.
- electrochemical oxidation of, A., 479.
- reduction of, A., 1133.
- electrolytic reduction of, A., 237, 705.
- condensation of, A., 499.
- reaction of, with diazomethane, A., 383.
- with polyhydric alcohols, A., 514.
- compounds of, with magnesium iodide alkoxides, A., 1240.
- with sulphur dioxide, A., 375.
- formation of liquid hydrocarbons from, A., 368.
- aliphatic, manufacture of, (P.), B., 832.
- electrolytic reduction of, to hydrocarbons, A., 1005.
- reaction of, with Grignard reagents, A., 598.
- as solvents, B., 331.
- aromatic, manufacture of derivatives of, (P.), B., 974.
- cyclic, A., 1032.
- manufacture of, (P.), B., 764.
- hydroaromatic, preparation of phenols by dehydrogenation of, A., 266.
- $\alpha\beta$ -unsaturated, autoxidation of, A., 398, 1139.
- oximes of, A., 163.
- detection of, colorimetrically, with sodium nitroprusside and hydroxylamine, A., 145.
- determination of, in essential oils, B., 368, 960.
- See also  $\alpha$ -Bromo-ketones, Cyano-ketones, Nitroso-ketones, and Oximino-ketones.
- Ketone substances, determination of, A., 1272.
- $\gamma$ -Ketonic acids, esters, condensation of, with aromatic aldehydes, A., 1031.
- 2-Keto-4-nitrophenyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acids, ethyl esters, A., 1144.
- $\beta$ -Keto- $\alpha$ -2:4-dinitrophenylpropane,  $\alpha$ -amino-, and its acetyl derivative, and their derivatives, and  $\alpha\gamma$ -dibromo-, A., 404.
- 2-Ketonucidine-3-acetic acid, oxidation of, A., 407.
- 19-Ketophenanthrindocoline, A., 168, 1041.
- 5-Keto-2-phenyl-4'-benzyloxy-3'-methoxybenzylidene-4:5-dihydro-oxazole, A., 69.
- $\gamma$ -Keto- $\alpha$ -phenyl- $\gamma$ - $p$ -bromophenylbutyronitrile, and its methyl ester, A., 1031.
- $\gamma$ -Keto- $\alpha$ -phenyl- $\gamma$ - $p$ -chlorophenylbutyronitrile, ethyl ester, A., 1031.
- $\delta$ -Keto- $\beta$ -phenyl- $\epsilon\epsilon$ -dibenzylhexoic acid, A., 738.
- 4-Keto-1-phenyl-2:6-dimethyl-1:4-dihydropyridine-3-carboxylic acid, methyl ester, A., 753.
- 4-Keto-5-phenyl-2:2-dimethyltetrahydro-oxazole, A., 865.
- 2-Keto-4- $\beta$ -phenylethyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acid, ethyl ester, A., 1144.
- $\delta$ -Keto- $\beta$ -phenylhexoic acid, and its derivatives, A., 737.
- 2-Keto-4-phenyliminazolidine. See 2-Keto-4-phenyltetrahydroiminoazole.
- $\gamma$ -Keto- $\alpha$ -phenyl- $p$ -methoxyphenylbutyronitrile, and its methyl ester, A., 1031.
- $\delta$ -Keto- $\beta$ -phenyl- $\epsilon$ -methylhexoic acid, A., 738.
- 2-Keto-4-phenyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acid, ethyl ester, A., 1144.
- 5-Keto-2-phenyl-4'-2'-nitro-4'-acetoxy-3'-methoxybenzylidene-4:5-dihydro-oxazole, A., 69.
- 5-Keto-2-phenyl-4-nitrobenzylidene-4:5-dihydro-oxazoles, A., 69.
- $\beta$ -Keto- $\alpha$ -phenylpropyl alcohol, optically active, A., 510.
- 2-Keto-4-phenyltetrahydroiminoazole, A., 284.
- $\alpha$ -Ketopropaldehyde, and  $\beta\beta$ -tribromo-, phenylhydrazones, A., 377, 1125.
- $\alpha$ -Keto- $\beta\gamma$ -isopropylidenedioxyglutaric acid, salts of, A., 144.
- Ketoretene, A., 943.
- Ketoretenesulphonic acid, potassium salt, A., 943.
- $\epsilon$ -Keto- $\alpha$ -rhamnohexonic acid, and its barium salt and derivatives, A., 721.
- $\delta$ -Ketorhammonic acid, methoxysulvanecarboxylic acid from, A., 518.
- Ketosis, A., 641, 1279.
- 2-Keto-4-styryl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acid, ethyl ester, A., 1144.
- 1-Ketotetrahydronaphthalene-2-glyoxylic acid, ethyl ester, benzoylhydrazones of, A., 864.
- 4-Keto-1:2:3:4-tetrahydrophenanthrene, derivatives of, A., 608.
- 1-Keto-1:2:3:4-tetrahydrophenanthreneglyoxylic acids, ethyl esters, A., 608.
- 2-Keto-1:2:3:4-tetrahydropyrimidines, synthesis of, A., 1144.
- $\delta$ -Keto- $\alpha\gamma\delta$ -tetraphenyl- $\Delta^2$ - $n$ -butene,  $\alpha$ -hydroxy-, and its derivatives, A., 518.
- 4-Keto-2:3:5:5-tetraphenyltetrahydrofuran, 2:3-dihydroxy-, A., 518.
- 2-Keto-2':4':6'-trimethoxyphenyl-6-methyl-1:2:3:4-pyrimidine-5-carboxylic acid, ethyl ester, A., 1144.
- 4-Keto-2:2:5-trimethyl-3:5-dihydro-oxazole, A., 865.
- $\delta$ -Keto- $\beta\beta\epsilon$ -trimethylheptoic acid, and its derivatives, A., 738.

**Ketotrimethyl-1:2:3:4-tetrahydronaphthalenes**, and their derivatives, A., 278.  
**4-Ketotrimethyl-1:2:3:4-tetrahydrophenanthrenes**, and their semicarbazones, A., 1024.  
 **$\alpha$ -Keto- $\gamma$ -valeric acid**, decarboxylation of, A., 194.  
**Ketoximes**, unsaturated, rearrangement of, A., 386, 387.  
**Ketys**, metallic, structure of, A., 386.  
**Kid**, glazed, "Arazym" method for production of, B., 904.  
**Kidneys**, factors determining weight of, A., 300, 422.  
 relation of function of, to weight and body surface, A., 1279.  
 urea clearance test as index of function of, A., 1159, 1279.  
 energy exchange of, A., 1281.  
 effect of aluminium chloride on respiration of, A., 89.  
 effect of amino-acids on respiration of, A., 82.  
 influence of sodium halides on respiration and glycolysis of tissues of, A., 1281.  
 effect of, on elimination of phenols from blood, A., 962.  
 formation of ammonia in, A., 638.  
 deposition of fat in, A., 875.  
 serum-proteins in disease of, A., 642.  
 human, glycogen content of, A., 415.  
 ox, uricase from, A., 650.  
**Kieselguhr**, use of, as a filter-aid in sugar factories, B., 956.  
 ordinary and prepared, microscopical examination of, B., 1011.  
**Kiganene**, A., 277.  
**Kiganol**, and its derivatives, A., 277.  
**Kilns**, (P.), B., 407\*, 451, 1107.  
 heating of, (P.), B., 660.  
 sillimanite refractories for, B., 182.  
 for drying of wood, etc., (P.), B., 660.  
 for heat-treatment of refractory materials, etc., (P.), B., 800.  
 for pottery manufacture, (P.), B., 726.  
 cement, (P.), B., 25.  
 dust collectors for, (P.), B., 292.  
 drying, (P.), B., 243, 1060.  
 electric, for firing of ceramic ware, (P.), B., 732.  
 laboratory, B., 342.  
 lime, (P.), B., 773.  
 operation of, in Japan, B., 549.  
 "Manchester," attempted heat balance in, B., 1079.  
 portable, for burning of charcoal, etc., (P.), B., 669.  
 rotary, (P.), B., 163, 404, 729.  
 conditions for firing of, with coal, B., 52.  
 lifter bars, blades, etc., for, (P.), B., 211.  
 with stationary hearth and travelling tunnel, B., 548.  
 manufacture of cement in, B., 424; (P.), B., 507.  
 for burning of cement, lime, etc., (P.), B., 106.  
 tunnel, (P.), B., 423, 936.  
 control of circulation in, B., 725.  
 lubrication of cars for, B., 888.  
 with multiple conveyor tracks, (P.), B., 384.  
 treatment of ceramic articles, etc., in, (P.), B., 24.  
**Kinematograph films**, (P.), B., 369.  
 production of, (P.), B., 752.  
 concentrations of elon and hydroquinone in borax developer for, B., 865.  
 development, tinting, toning, etc., of, (P.), B., 369.

**Kinematograph films**, reducing and intensifying solutions for, B., 401.  
 with images on both faces, (P.), B., 704.  
 adapted for sound reproduction, tinting of, (P.), B., 658.  
 colour and sound, production of, (P.), B., 961.  
 exposed, production of, (P.), B., 752.  
 lenticular, projection of, (P.), B., 369, 914.  
 multi-colour, production of, (P.), B., 704.  
 positive, replenishing solution for developer for, B., 129.  
 sound, treatment of images on, (P.), B., 49.  
 used, renewal of, (P.), B., 288.  
 detection of sodium thiosulphate in, B., 129.  
**Kinematography**, fireproof screens for, (P.), B., 1057.  
 coatings for screens for, (P.), B., 786, 913.  
 colour, (P.), B., 752.  
**Kinetics** of heterogeneous systems, A., 816.  
 chemical, empirical relationships in, A., 701.  
**Kino**, differentiation of cutch, gambier, and, B., 852.  
 assay of tinctures of, B., 1136.  
**Kipushite**, A., 494.  
**Kleinia articulata**, buffer systems of, A., 314.  
 pentosan content of, A., 1177.  
**Kneading machines**, (P.), B., 244.  
**Knives**, steel. See **Steel knives**, under **Iron**.  
**Kojic acid**, production of, by *Aspergillus flavus*, A., 1168.  
 derivatives of, A., 63.  
**Kola nut**, determination in, of caffeine, B., 367.  
**Kolbe's reaction**, A., 348.  
**Koumine**, and its salts, A., 101.  
**Koumimine**, and its hydrochloride, A., 101.  
**Kouminidine**, and its salts, A., 101.  
**Kouminine**, and its salts, A., 101.  
**Krameria**, assay of tinctures of, B., 1136.  
**Krypton**, spectrum of, A., 2, 208, 1183.  
 are spectrum of, A., 207.  
 Aston's dark space in, A., 2.  
 ionisation of, by slow alkali ions, A., 4.  
 crystal structure of, A., 325.  
 enrichment of gases in, (P.), B., 422.  
 "Kufri," use of, as a fertiliser in Egypt, B., 124.  
**Kukkersite**, stability of, B., 965.  
 evaluation of, by means of its specific gravity, B., 216.  
**Kurchichine**, and its salts, A., 406.  
**Kurchine**, and its salts, A., 406.  
 "Kvass," origin and composition of, B., 204.  
**Kyanite** in Bhandara district, India, A., 247.  
**Kynurenine**, as supplement to tryptophan-deficient diet, A., 876.

## L.

**Laboratories**, chemical, apparatus for, A., 1227.  
**Lac**, button, humidity and storage of, B., 851.  
**Lac insect**. See *Tachardia lacca*.  
**Laccol**, constitution of, A., 943.  
**Lachesis atrox**, effect of venom of, on dog's blood, A., 1273.  
**Lacquers**, B., 153.  
 manufacture of, (P.), B., 197, 518, 998.  
 absorption of ultra-violet light by films of, A., 6.

**Lacquers**, poisonous effects of driers in, B., 314.  
 removal of, from metals, (P.), B., 687.  
 composition for, (P.), B., 234.  
 terminology in exposive tests on, B., 195.  
 for application by brushing, (P.), B., 518.  
 as protective under coatings, B., 196.  
 use of, in the canning industry, B., 239.  
 benzylcellulose, B., 436.  
 cellulose, B., 234, 356; (P.), B., 437, 614.  
 for undercoating, (P.), B., 518.  
 nitrocellulose, B., 153; (P.), B., 436, 518.  
 solvent balance in, B., 618.  
 solvent power and dilution ratio of, B., 687.  
 green colours for, (P.), B., 807.  
 gutta-percha resin for, B., 778.  
 plasticisers for, (P.), B., 196, 561, 997.  
 properties of, B., 392.  
 removers for, (P.), B., 902.  
 softening agents for, (P.), B., 737.  
 thinners for, (P.), B., 901.  
 compatibility of polychlorodiphenyls in, B., 314.  
 for metals, B., 196.  
 pigmented, B., 196; (P.), B., 118.  
 weather-resistance of, B., 613.  
 testing of, B., 947.  
 nitrocellulose and spirit, manufacture of, B., 613.  
 nitrostarch, (P.), B., 807.  
 quick-drying, (P.), B., 998.  
**Lactacidogen**, fission of, in contraction of muscle, A., 188.  
 in muscular exercise, A., 645.  
 in fatigue of muscle, A., 188.  
**Lactamide-acetone**. See **4-Keto-2:2:5-trimethyl-3:5-dihydro-oxazole**.  
**Lactase** in blood-plasma and -serum or in urine after injection of lactose, A., 765.  
**Lactation**, A., 958.  
 intake of food in, A., 297.  
**Lactic acid**, A., 720.  
 production of, by fermentation, (P.), B., 1004.  
 purification of, (P.), B., 94.  
 equilibrium of, with pyruvic acid, A., 809.  
 potential of change of, to pyruvic acid, A., 813.  
 co-enzyme of oxidation of, A., 1165.  
 use of, in food preserves, B., 285.  
 enzymic formation of, A., 1287.  
 co-enzyme of formation of, A., 881.  
 decomposition of, by acetic bacteria, A., 545.  
 formation of, in rabbit's intestine, A., 645.  
 activation of, in muscle, A., 1287.  
 effect of synthalin on, in frog's muscle, A., 540.  
 by streptococci, A., 653.  
 influence of bile acids on formation and excretion of, A., 875.  
 in blood, A., 421.  
 effect of narcosis on, A., 191.  
 in blood, bile, and urine during hepatic disturbance, A., 536.  
 in umbilical cord blood, A., 183.  
 in brain, relation of, to blood-sugar, A., 637.  
 oxidation of, by brain tissue, A., 188.  
 formation of glycogen from, in liver, A., 86.  
 determination of, A., 1269.  
 in blood, gasometrically, A., 75.  
 in presence of glycollic and  $\alpha$ -hydroxy-butyric acids, A., 720.

**Lactic acid**, determination of, in milk and its products, B., 1052.  
 in muscle, A., 532, 875.  
 in silage, B., 1129.  
 in vegetable tanning liquors, B., 1001.  
 in wines, B., 281.  
 in wines and fruit juices, B., 1051.

**Lactic acid**, calcium salt, in baking powders, B., 445.  
 magnesium salt, effect of, in diet, on calcium and magnesium metabolism, A., 87.

**Lactic acid**, thio-, oxidation-reduction potential of, A., 472.

*Lactobacillus acidophilus*, A., 1066.  
 peptone agars for, A., 654.

*Lactobacillus pentoceticus*, xylose fermentation by, A., 1169.

**Lactobionic acid**, enzymic hydrolysis of, A., 1165.

**$\beta$ -Lactones**, formation and stability of, A., 614.

**$\delta$ -Lactones**, formation of, by oxidation of aldoses, A., 1019.

**Lactonisation**, A., 251.

**Lactose** (*milk-sugar*), manufacture of, (P.), B., 1101.  
 alkaline degradation of, A., 148.  
 in nutrition, A., 1282.  
 utilisation of, in pigs and rats, A., 421.  
 detection of, in urine, A., 767.  
 determination of, iodometrically, in milk, A., 872.  
 in milk and its products, B., 700.  
 in milk and cacao products, B., 1052.

*allo*Lactose, constitution of, and its osazone, A., 1021.

**$\alpha$ -Lactose- $\beta$ -lactose**, A., 148.

**Lævulinic acid**, allyl and  $\beta\gamma$ -dibromo- and  $\beta\gamma$ -dichloro-propyl esters, and their derivatives, A., 1019.  
 ethyl ester, ketoperoxide of, A., 43.  
*p*-nitrophenylhydrazine, A., 402.

**Lævulose** (*d-fructose*; *fruit-sugar*), production of, B., 76, 396.  
 from Jerusalem artichoke juices, B., 280.  
 action of boric acid and borates on rotatory power of, A., 120.  
 determination of, in blood, A., 1054.  
 in maize, A., 437.  
 See also Fructose.

**Lakes**, salt, mud and brine of, A., 492.

**Lakes**, colour, manufacture of, (P.), B., 118, 154, 222, 315, 436, 1127.  
 from methyleneanthrones, (P.), B., 1115.  
 from petroleum, (P.), B., 517.  
 fastness to light of, B., 71.  
 fading of, B., 418, 497.  
 influence of humidity on, B., 947.

**Lake Agigea**, chemistry of water and silt of, A., 926.

**Lake ores**. See under Ores.

**Lamb**, New Zealand, freezing, storage, and transport of, B., 959.

*Laminaria digitata*, iodide fission by, A., 202.

**Laminated materials**, cement for, (P.), B., 439.

**Lamps**, calibration of, by means of line spectra, A., 892.  
 introduction of alkali metals into bulbs of, (P.), B., 352.  
 capillary mercury, A., 827.  
 electric. See Electric lamps.  
 mercury vapour, A., 924.  
 metal supports in, (P.), B., 352.  
 quartz, use of, in quantitative analysis, A., 921.  
 mercury-vapour, A., 137.

**Lamps**, ultra-violet, control of, A., 1105.  
 xenon, A., 491.

**Lamp oils**, influence of unsaturated olefines on illuminating power of, B., 710.

**Lampblack**, manufacture of, (P.), B., 8, 1017.

**Lampreys**, anticoagulant in testes and eggs of, A., 414.

**Lanaurin**, A., 417.

**Langbeinite**, crystal structure of, A., 12.

*Lansium domesticum*, rind and resin from, B., 434.

**Lanthanum**, atomic weight of, A., 317.  
 preparation of, iron- and silicon-free, A., 580.  
 Zeeman effect in spectrum of, A., 1071.  
 crystal structure of, A., 1192.  
 heat of formation of compounds of, with aluminium and magnesium, A., 575.

**Lanthanum alloys**, A., 455.

**Lanthanum nitrate**, thermal decomposition of, in carbon dioxide, A., 132.  
 nitride, heat of formation of, A., 998.  
 trioxide, A., 584.  
 hydration of, A., 125.  
 selenates, A., 707.

**Lanthanum detection and determination** : —  
 detection and determination of, spectroscopically, A., 590.

**Lard**, behaviour of, in ultra-violet light, B., 749.  
 effect of diet of arachis nut on arachidic acid in, A., 189.  
 thiocyanogen value of, B., 559.  
 detection in, of adulterants, B., 946.  
 of alkali, B., 1039.

**Larocaine**, detection of, in presence of novocaine and tutocaine, B., 1136.

**Lasiocarpine**, A., 865.

**Laterites**, A., 927.

*Lathyrus odoratus*, respiration of, A., 1176.

*Lathyrus sativus*, nutrition of albino rats with seeds of, A., 192.

**Laudanosoline**, and its 3':4'-dimethyl ether, dehydrogenation of, A., 1046.  
 salts of, A., 527.  
 4'-methyl and 6:7:3'-tribenzyl-4'-methyl ethers, A., 1040.

*dl*-Laudanosoline, derivatives of, A., 1047.

**Laughing gas**. See Nitrogen monoxide.

**Laurel**, Portuguese, glucoside from, A., 662.

**Laurelines**, synthesis of, A., 526.

**Lauric acid**, acid potassium salt, A., 1018.  
 dodecyl ester, A., 44.  
*p*-iodophenacyl ester, A., 744.

**6-Laurylamino-2-methylquinoline**, derivatives of, A., 623.

**Lavender oil**, French, cineole in, B., 1104.

**Lawns**, control of weeds in, by spraying, B., 124.

**Lawsonite**, structure of, A., 1079.

**Leaching apparatus**, (P.), B., 822.

**Lead atoms**, reflexion of, from sodium chloride crystals, A., 1185.  
 decomposition of, A., 4.  
 isotopes of, A., 442, 554, 668, 670.  
 and their nuclear moments, A., 552.  
 isotope displacements of, A., 668.  
 allotropy of, A., 327.  
 in oceanic alkali halides, A., 358.  
 recovery of, from sulphide ores, (P.), B., 895.  
 from zinc distillation residues, (P.), B., 1123.  
 refining of, (P.), B., 112, 352, 556.  
 apparatus for, (P.), B., 1088.  
 by the Harris process, B., 348.  
 and its alloys, (P.), B., 989.  
 recovery of metals from residues from electrolytic refining of, (P.), B., 151.

**Lead**, removal of arsenic from, (P.), B., 112.  
 removal of copper from, (P.), B., 1087.  
 spectrum of, A., 787, 892.  
 arc spectrum of, A., 104.  
 ultra-violet spark spectrum of, A., 440.  
 disintegration of, by cosmic rays, A., 556, 670.  
 transmission of X-rays by, A., 1074.  
 absorption of X-rays by, A., 669.  
 scattering of X-rays by, A., 11.  
 absorption by, of neutrons from boron, A., 1073.  
 resistance of, at low temperatures, A., 799.  
 to high-frequency currents, A., 328.  
 co-deposition of bismuth and, A., 1005.  
 thermo-electric force of, against silver alloys, A., 453.  
 effect of metals on compressibility of, B., 681.  
 diffusion of metals into, A., 1195.  
 energy content of, near change point of superconductivity, A., 453.  
 equilibrium of, with cadmium, and cadmium and lead chlorides, A., 1205.  
 with lead chloride, tin, and stannous chloride, A., 1205.  
 with lead and silver bromides, and silver, A., 1205.  
 grain size, eutectics, and corrosion of, B., 510.  
 corrosion of, B., 644.  
 by potassium and other alkali salt solutions, B., 985.  
 chemical corrosion of, in presence of phenol, B., 310.  
 protection of, against corrosion, (P.), B., 683.  
 coating of iron with, (P.), B., 730.  
 coating of metals with, (P.), B., 803.  
 and its alloys, manufacture of cables and articles of, (P.), B., 268.  
 for construction of chemical plant, B., 1059.  
 pharmacology of, A., 542, 774.  
 toxicology of, B., 623.  
 absorption and distribution in the organism in poisoning, A., 1164.  
 excretion of, in urine, A., 1277.  
 colloidal, preparation of, (P.), B., 190.  
 pulverised, production of, (P.), B., 190.  
 red. See Red lead.  
 white. See White lead.

**Lead alloys**, (P.), B., 684.  
 production of, (P.), B., 775.  
 for extrusion, (P.), B., 112.  
 of high tensile strength, (P.), B., 389.  
 dissolving of, for determination of tin and antimony, B., 941.  
 bearing metal, (P.), B., 190, 191.  
 effect of cadmium on, B., 265.  
 corrosion-resistant, (P.), B., 231.  
 B.N.F. ternary, corrosion-resistance of, B., 681.  
 waste, removal of copper from, (P.), B., 556.  
 determination in, of bismuth, B., 1121.

**Lead alloys with alkaline-earth metals**,  
 production of, (P.), B., 731.  
 with aluminium, A., 685.  
 with antimony, A., 907; (P.), B., 191.  
 removal of tin from, (P.), B., 471, 1123.  
 for cable sheaths, (P.), B., 231.  
 with antimony and tin, equilibrium of, A., 1082.  
 with bismuth, refining of, (P.), B., 1088.  
 and with thallium, conductivity of, A., 905.  
 with cadmium and nickel, spontaneous hardening of, A., 567.



Lead alloys with copper and with silver, magnetism and electrical resistance of, A., 1082.  
 with sodium, reductions with, A., 49.  
 with thallium, superconducting, thermal resistance of, A., 1194.  
 with tin, A., 1082.  
 recovery of, from white-metal scrap, (P.), B., 1087.  
 with zinc, eutectic, B., 186.  
 Lead compounds, production of, (P.), B., 935.  
 Lead salts, effect of, on antibody formation, A., 1060.  
 Lead arsenate, use of hydrates in sprays of, B., 62.  
 azide, crystals of, A., 11.  
 bromide, thermodynamics of, in silver bromide solution, A., 999.  
 equilibrium of, with lead, silver, and silver bromide, A., 1205.  
 reaction of, with sulphides, A., 584.  
 bromide and chloride, thermodynamics of solid solutions of, A., 809.  
 carbonate or hydroxide, electrolytic production of, (P.), B., 422.  
 carbonate, basic. See White lead.  
 chloride, structure of, A., 1079.  
 equilibrium of, with cadmium, cadmium chloride, and lead, A., 1205.  
 with lead, tin, and stannous chloride, A., 1205.  
 with potassium chloride and water, A., 810.  
 tetrachloride, ammonolysis of, A., 1100.  
 chlorofluoride, crystal structure of, A., 450.  
 chromate, crystallography of, A., 1218.  
 rhombic, A., 351.  
 fluobromide, crystal structure of, A., 681.  
 halides, absorption spectra and thermal constants of, A., 673.  
 dihalides, crystal structure of, A., 797.  
 iodide, precipitation of, A., 351.  
 nitrate, crystallisation of, A., 113.  
 equilibrium of, with sodium and potassium nitrates, A., 468, 1205.  
 decomposition of, in molten potassium nitrate, A., 707.  
 nitrochloride, A., 1100.  
 suboxide, A., 132, 823, 1100.  
 monoxide, apparatus for production of, from lead, (P.), B., 684.  
 polymorphism of, A., 326.  
 equilibrium of, with arsenic pentoxide and water, A., 125.  
 equilibria of, with antimony oxide, B., 681.  
 equilibrium of, with silicon dioxide, A., 1090.  
 dioxide, analysis of, (P.), B., 474.  
 determination of, A., 589; B., 259, 546.  
 oxides, A., 697.  
 manufacture of, (P.), B., 146.  
 crystal structure of, A., 326.  
 finely-divided, manufacture of, (P.), B., 146.  
 determination in, of active oxygen, A., 921.  
 phosphates, solubility of, A., 990.  
 sulphate, basic, manufacture of, (P.), B., 31, 103.  
 sulphide, heat capacity of, A., 328.  
 unidirectional layer in, A., 676.  
 oxidation of, (P.), B., 770.  
 disulphide, preparation of, from lead mercaptides and sulphur, A., 132.

Lead organic compounds, A., 1050, 1148.  
 Lead alkyls, rearrangement and hydrogenation of, A., 1050.  
 aryls, reaction of, with organic lead salts, and mercury aryls, A., 1050.  
 diphenyl di-(*p*-dimethylaminophenyl) and ditolyl and triphenyl and tetra-*p*-dimethylaminophenyl, A., 1148.  
 phenyldi-*o*-tolyl chloride, A., 1050.  
 tetra-alkyls, stabilisation of, (P.), B., 878.  
 tetraethyl, influence of, on knock rating of gasoline, B., 790, 791.  
 determination of, in ethyl gasoline, B., 247.  
 tetramethyl, thermal decomposition of, A., 474.  
 Lead detection, determination, and separation:—  
 detection of, in bismuth salicylate, B., 723.  
 in urine, A., 774.  
 detection and determination of, in tin-plate for preserving cans, B., 606.  
 determination of, in small quantities, A., 542.  
 volumetrically, A., 355, 490.  
 in babbitt metal, B., 265.  
 in conductivity water, A., 826.  
 in earthenware, B., 841.  
 in presence of iron, A., 1103.  
 in iron salts, B., 1119.  
 in minerals, A., 589.  
 in water, B., 818.  
 determination in, of silver, B., 265.  
 of tin, spectroscopically, A., 35.  
 separation and determination of, in presence of iron, A., 1223.  
 separation of, from copper, A., 1011.  
 Lead accumulators. See under Accumulators.  
 Lead electrodes. See under Electrodes.  
 Lead minerals of N.S. Wales, A., 248.  
 Lead ores of Burma, A., 249.  
 treatment of, (P.), B., 609.  
 slags from, B., 802.  
 production of soluble lead salts from, (P.), B., 341.  
 separation of bismuth from, (P.), B., 471.  
 oxidised, flotation of, (P.), B., 556.  
 containing silver, flotation concentration of, (P.), B., 1087.  
 Lead poisoning. See under Poisoning.  
 Leather, manufacture of, B., 564, 853; (P.), B., 690, 1001.  
 application of ultra-violet light in, B., 853.  
 application of mass-action law in, B., 157.  
 microscopic control in, B., 438.  
 wetting and emulsifying agents for use in, (P.), B., 671.  
 treatment of, for boots and shoes, (P.), B., 1001.  
 machines for working of, (P.), B., 652.  
 rotary-tool machines for working of, (P.), B., 521.  
 coating of, (P.), B., 274.  
 colours for, (P.), B., 475.  
 impregnation of, (P.), B., 742.  
 lustring of, (P.), B., 742.  
 softening agents for, (P.), B., 463.  
 evaluation and softening action of fat-liquors for, B., 904.  
 tanning of, with pyrocatechol tanning extracts, (P.), B., 652.  
 mechanical tests on, B., 810.

Leather, determination of tensile strength of, B., 853.  
 density of, B., 1000, 1045.  
 effect of metals on, B., 72.  
 oil in, B., 853.  
 addition of sulphuric acid to, B., 616.  
 action of water on, B., 1045.  
 transmission of water vapour through, B., 1000.  
 defects in, caused by skin diseases, B., 360.  
 manufacture of substitutes for, (P.), B., 437.  
 from paper, (P.), B., 1075.  
 substitutes for, containing rubber, (P.), B., 1044.  
 plastic compositions as, (P.), B., 1042.  
 photomicrographs of, B., 439.  
 artificial, manufacture of, (P.), B., 35, 338.  
 from fibres, (P.), B., 97.  
 from rubber and cellulose derivatives, (P.), B., 675.  
 chestnut- or quebracho-tanned, deterioration of, by sulphuric acid, B., 198, 652.  
 chrome-tanned, fat-liquoring of, B., 810.  
 use of sulphonated castor oil in, B., 811.  
 distribution of fat in, when oiled with sulphonated oil, raw neatsfoot oil, and mineral oil, B., 780.  
 detanning of, B., 238.  
 function of acido-groups in, B., 273.  
 commercial and quebracho-tanned, containing sulphuric acid, deterioration of, B., 616.  
 dyed, fading of, B., 238.  
 detection in, of diamines and aminophenols, B., 652.  
 enamelled, production of, (P.), B., 742.  
 containing fish oils, resinous spews on, B., 741.  
 glove, wetting of, B., 238.  
 heavy, quality of, in relation to preliminary hydration of hides, B., 810.  
 imitation suède, (P.), B., 439.  
 patent, drying conditions for varnishes for, B., 153.  
 scrap, utilisation of, (P.), B., 742.  
 sole, tanning of, B., 741.  
 wear resistance of, B., 564.  
 variation in apparent density of, B., 690.  
 molecular absorptive power of, for water, B., 1000.  
 patterned, manufacture of, (P.), B., 780.  
 vegetable-tanned, determination of free sulphuric acid in, and its effect on tensile strength after storage, B., 741.  
 synthetically-tanned, "free sulphuric acid" in, after seven years' storage, B., 1045.  
 tanned, humidity and resistance properties of, B., 1001.  
 vegetable-tanned, stripping of, B., 394.  
 darkening of, on exposure to light, B., 810.  
 production of patterns on, with ultra-violet rays, B., 853.  
 analysis of, B., 359, 690.  
 determination in, of free mineral acids, B., 359, 741.  
 waste, treatment of, (P.), B., 811.  
 sampling of, B., 742.  
 analysis of, B., 359.  
 micro-analysis of, B., 72.  
 detection in, of formaldehyde, B., 690.

- Leather**, microscopical determination of tanning power and distribution of tans in layers of, B., 1001.  
determination in, of nitrogen, by hydrogenation, B., 951.  
of water-soluble matter, effect of temperature on, B., 274.
- Leather-board**, shrinkage of, caused by chlorination, B., 674.
- Leaves**, changes in, during night, A., 548.  
biochemistry of fall of, A., 889.  
epinasty of, induced by ethylene, A., 890.  
effect of irradiation on lipins of, A., 437.  
immunology with press juice and pigments of, A., 206.  
action of arsenic on, A., 666.  
autumn, pigments of, A., 976.  
dead, in forest beds, nitrogen fixation in, A., 1296.  
etiolated and green, manganese in, A., 665.  
fibrous, decortication of, (P.), B., 596.  
green, variation in accumulation of starch in, A., 1180.
- Lecanoric acid**, methyl ester, A., 851.
- Lecithin**, A., 765.  
preparation of, from soya-beans, B., 1007.  
working-up of materials containing, (P.), B., 240.  
physical chemistry of, A., 807, 911.  
crystal growth of, A., 1154.  
colloidal condition of, A., 632, 844.  
sols, complex coacervation of, A., 693, 807.  
production of aqueous emulsions of, (P.), B., 765.  
use of, in insecticidal emulsions, B., 441.  
antigenic properties of, A., 869.  
animal and vegetable, effect of, on diffusion of acids and alkalis in gels, A., 1203.  
plant, treatment of, (P.), B., 656.  
uses of, B., 46.  
detection of, colorimetrically, A., 1270.  
in chocolate products, B., 575.  
determination of, in chocolate, B., 749.  
in blood and plasma, A., 75.
- $\alpha$ - and  $\beta$ -**Lecithins** from human brain, A., 958.
- Lecitho-vitellin**, alkaline hydrolysis of, A., 1153.
- Lecture experiments**, improving visibility of, A., 358.
- Legrandite**, A., 1015.
- Legumes**, effect of, on nitrogen economy in production of crops, B., 39.
- Leguminosae**, fixation of nitrogen by, A., 883.  
potash fertilisers for, B., 1047.
- Leguminous flakes**, manufacture of, (P.), B., 399.
- Lehrs**, (P.), B., 307, 384, 679.  
for annealing glass bottles, etc., (P.), B., 772.  
electric, for annealing of glassware, etc., (P.), B., 771.
- Leishmann's dye**, B., 975.
- Lemna**, composition of, A., 102.
- Lemna minor**, manganese for growth of, A., 205.
- Lemon juice**, reducing substances in, A., 310, 658.  
reducing capacity and antiscorbutic activity of, A., 1294.  
antiscorbutic fraction of, A., 887.  
vitamin-C from, A., 201.  
use of, in foods, B., 862.
- Lemon oil**, catalytic hydrogenation of terpenes from, B., 79.  
Californian, B., 657.  
machine-extracted, composition of, B., 448.  
sponge- and machine-extracted, differentiation of, B., 1055.  
Sicilian, B., 400.
- Lemonade**, effervescent, preparation of, B., 1053.
- Lemongrass oil** of Africa and the Comoro Is., B., 287.
- "**Lentine**." See Carbamylcholine chloride.
- Lenzites sepiaria**, toxicity of water-soluble extractives of Western yellow pine to, A., 204.
- Leontamine**, and its salts, A., 889.
- Leontica eversmannii**, alkaloids of, A., 889.
- Leontidine**, and its salts, A., 889.
- Lepidosiren**, male, emission of oxygen by pelvic filaments of, A., 420.
- Leprosy**, drugs for use against, (P.), B., 528.  
blood-serum-calcium in, A., 1158.
- Leptospermum**, essential oil of, B., 400.
- Letovicite**, A., 1015.
- Lettuce**, effect of soil reaction on growth, nitrogen, phosphorus, and manganese content of, B., 158.  
effect of boron on growth of, B., 441.  
control of bottom rot of, B., 569.
- Leucæmia**, proteolytic leucocytic enzyme in, A., 768.
- Leucine**, phenylhydantoin of, A., 184.
- Leucines**, isomeric, dissociation pressures of compounds of, with ammonia and hydrogen chloride, A., 1023.
- isoLeucine**, configuration of, in Walden inversion, A., 605.
- L(+)-isoLeucine**, identification of, in brain proteins, A., 631.
- Leucine-N-sulphonic acid**, and its salts, A., 1023.
- Leucite**, treatment of, with nitric acid, (P.), B., 422.  
removal of silicic acid in, with acids, B., 21.
- Leuco-bases**, formation of, from ortho-formanilides, A., 1024.
- Leucocytes**. See Blood-corpuscles, white.
- Leuco-thioindigotin**, action of, with benzyl chloride, A., 861.
- Leucothoe grayana**, as a contact insecticide, B., 698.
- dl-Leucyl-dl- $\alpha$ -aminobutyric acid**, and its *p*-nitrobenzoyl derivative, A., 957.
- $\alpha$ -dl-Leucyldipalmitin**, A., 364.
- $\alpha$ -dl-Leucyldestearin**, A., 364.
- Leucylglycine-N-sulphonic acid**, and its potassium salt, A., 1023.
- d-Leucylglycylglycine**, A., 1269.
- d-Leucyl-d-leucylglycylglycine**, A., 1269.
- Lewisite**, crystal structure of, A., 682.
- Libraries**, preservation of paper in, B., 177.
- Lichens**, chemistry of, A., 663.  
treatment of, for use as floral decorations, (P.), B., 798.
- Lichen acids**, A., 742, 850.
- Lichen substances**, A., 275, 396, 521, 613, 620, 851.
- Lichestic acid**, constitution of, and its methyl ester, A., 931.
- Lichesterylic acid**, semicarbazone of, A., 931.
- Liesegang rings**, A., 807, 994.  
formation of, in gelatin, A., 467.
- Life**, relation of, to electricity, A., 664.
- Light**, production of, by collisions, A., 442.
- Light**, absorption of, and adsorption energy, A., 909.  
by metals, A., 787.  
division of, between two absorbing substances, A., 1188.  
scattering of, in relation to molecular structure, A., 898.  
polarisation of, A., 898.  
in liquids, A., 7, 676.  
in solids, A., 213.  
molecular scattering of, A., 108.  
by solids, A., 559.  
transmission of, in diffusing media, B., 915.  
hiding power of diffusing media for, B., 915.  
effect of, on enzymes, A., 90.  
biological efficacy of kinds of, A., 966.  
convergent, production of layer-line diagrams with, A., 681.  
monochromatic, from a spark source, A., 137.  
monochromatic red and yellow, sources of, A., 245.  
polarised phosphorescent, A., 445.  
ultra-violet, measurement of intensity of, (P.), B., 1039.  
use of fluorescence for photometric measurement of, A., 213.  
electric lamps as sources of, B., 312.  
glass bulb for generator for, (P.), B., 1032.  
emission of, by vegetable matter, A., 1189.  
effect of, on disperse systems, A., 570.  
hydrolysis of acetone by, A., 1215.  
action of, on ethane, A., 1215.  
on mercury fulminate, A., 1214.  
industrial application of tests with, B., 1073.  
photobiological sensitisation to, A., 1284.  
effect of antagonism of calcium and sodium on biological action of, A., 302.  
filtered, illuminating device for experiments in, A., 1225.  
necrobiotic, A., 1076.  
visible monochromatic, biological activity of, A., 542.
- Light filters** for mercury lamps, A., 1013.
- Lignin**, A., 161, 501, 558, 616.  
constitution of, A., 57.  
structure of cellulose and, B., 928.  
absorption spectra of solutions of, A., 674.  
and related compounds, ultra-violet absorption of, A., 272.  
"coalification" of, B., 245, 917.  
hydrolysis of, with hydrochloric acid, A., 1032.  
hydrochloride, formation of aromatic substances from, by fusion with potassium hydroxide, A., 1249.  
alkali, distillation of, with zinc dust in hydrogen, A., 616.  
conifer, A., 616.  
formula of, A., 57.  
fir, A., 852.  
mummified, A., 1015.  
pine, A., 161.  
spruce, influence of, on sulphite pulp, B., 499.  
synthetic, B., 836.  
wood, properties of, B., 542.  
determination of, by 72% sulphuric acid method, B., 593.  
in plant materials, B., 618.
- Lignin glycol**, and its ethers, A., 161.
- Ligninsulphonic acids**, derivatives of, A., 616.
- Lignite**, drying of, in relation to its structure, B., 758.

- Lignite**, carbonisation of, B., 664, 1110.  
destructive distillation of, (P.), B., 536.  
acids from low-temperature tar from, B., 665.  
Dakota, absorption of water by, B., 869.  
coking of, B., 326.  
Italian, B., 407.  
low-temperature distillation of, under pressure, B., 758.  
Rumanian, products from cracking of, B., 790.  
composition of neutral oils from tars from, B., 790.  
from Valdarno, Tuscany, tarry water from, B., 408.  
determination in, of humic acid, B., 758.  
**Lignocerylphingosine**, A., 294.  
**Lignosulphonic acid**, catalytic effect of, A., 1004.  
**Lignosulphonic acids**, A., 616.  
precipitation and colloid titration of, with fuchsin, B., 223.  
**Lignothioloacetic acid**, A., 385.  
**Limestone**, field analytical apparatus for, B., 145.  
analysis of, A., 588.  
**Limulus**, salt effect with amoebocyte urease of, A., 304.  
**Limulus polyphemus**, effect of hydrochloric acid on oxygen combination with haemocyanin of, A., 1151.  
 $\beta$ -**Linalolene**, isomerisation of, to dihydro-myrcene, and its dibromide, A., 857.  
**Linalool**, isomerisation of, to camphor, A., 165.  
and its acetate, action of sulphur on, A., 1038.  
**Linen**, washing of, (P.), B., 337.  
cooking liquors for, B., 334.  
**Linen fabrics**, strength standard for, B., 795.  
testing of, B., 795.  
**Linen yarns**, strength standard for, B., 795.  
**Linkings**, chemical, A., 215, 561.  
conjugated, A., 365.  
double, A., 158, 258, 600, 618.  
co-ordinate, polarity of, A., 528.  
covalent, additive energy of, A., 901.  
double, dipole moment measurements in substances containing, A., 506.  
quantum theory of, A., 1190, 1191.  
autoxidation of, A., 1003.  
single, A., 215.  
energy of, A., 1191.  
**Linoleic acid**, structure of, A., 832.  
hydrogenation of, A., 832.  
in arachis oil, A., 601.  
effect of carotene and vitamin-A on oxidation of, A., 782.  
ethyl ester, hydrogenation of, A., 832.  
**Linolenic acid**, constitution of, A., 252.  
glyceryl ester, drying and yellowing of, B., 115.  
**Linoleum**, manufacture of, B., 392; (P.), B., 357, 563, 737, 738, 902, 1042.  
manufacture of inlaid coverings or "tiles" for floors from, (P.), B., 1092.  
inlaid, manufacture of, (P.), B., 273, 357.  
moulded, production of, (P.), B., 738.  
**Linseed oil**, nutritive value of proteins of, A., 189.  
as protein supplement for calves, A., 1161.  
relative nutritive value of proteins of cottonseed meal and, A., 299.  
**Linseed oil**, composition of, A., 43; B., 516, 560, 647.  
production of, in Palestine, B., 312.  
purification of, B., 193; (P.), B., 517.  
action of light on, B., 647.  
**Linseed oil**, abnormal drying of, B., 391.  
influence of siccatives on drying of, B., 116.  
drying and atmospheric oxidation of, B., 849.  
drying of unsaturated glycerides of, B., 193.  
hardening of, at low temperatures, B., 70.  
thickening of, by addition of tung oil, (P.), B., 270.  
effect of heat treatment on, B., 899.  
changes in properties of, during heat-bodying, B., 312.  
effect of terpene hydrocarbons, alcohols, aldehydes, ketones, acids, and phenol derivatives on oxidation of, B., 1124.  
reactions of red lead and, B., 900.  
analysis of, B., 735.  
determination of iodine value of, by Margosches' method, B., 515.  
potentiometric determination of acid value and free fatty acids of, B., 269.  
detection in, of rosin, rosin oil, and heavy metals, B., 647.  
**Linum usitatissimum**, influence of climate during ripening on composition of oil from, B., 805.  
**Lipæmia**, alimentary, blood-lipins in, A., 961.  
**Liparites**, production of earthenwares from, B., 887.  
**Lipase**, A., 776.  
activation of, by polypeptides, A., 776.  
specificity of, A., 649.  
in dairy products, inactivation of, by heavy metals, A., 1288.  
influence of liver damage on, in serum, A., 869.  
atoxyl-resisting, in blood-serum, A., 872.  
castor-seed, hydrolysis of vegetable oils by, A., 1165.  
pancreatic, action of, in relation to surface effects, A., 1166.  
salivary, A., 295.  
serum, action of thyroxine on, A., 776.  
yeast, A., 1165.  
determination of, A., 881.  
**Lipins**, A., 954.  
physical chemistry of, A., 1089.  
effect of, on permeability, A., 415.  
and immunity, A., 1153.  
absorption and elimination of, in avitaminosis-A, A., 657.  
excretion of, A., 875.  
effect of adrenaline on, A., 1292.  
in blood, A., 535.  
in liver, A., 85.  
of normal and pathological organs, A., 959.  
in plasma in lactation and non-lactation, A., 423.  
in human serum in health and in cancer, A., 418.  
iodine value of, A., 185.  
**Liquids**, nature of, A., 115.  
two states of, A., 560.  
allotropy of, A., 683, 799, 1193.  
extraction of, B., 659.  
laboratory apparatus for, with low-boiling solvents, B., 710.  
purification of, (P.), B., 372.  
apparatus for, (P.), B., 454, 822.  
by electro-endosmosis, (P.), B., 945.  
electrolytically, (P.), B., 646.  
purification and concentration of, (P.), B., 788.  
clarification of, (P.), B., 164.  
apparatus for, (P.), B., 708.  
clarification tanks for, (P.), B., 293.  
washing of, with liquids, (P.), B., 662.  
**Liquids**, containing solids, drying of, (P.), B., 964.  
filters for, (P.), B., 212, 372, 533.  
removal of liquids of lower vapour pressure and gases from, (P.), B., 581.  
apparatus for removal of sludge from, (P.), B., 86.  
sterilisation of, (P.), B., 754.  
concentration of, (P.), B., 212.  
apparatus for screening of, (P.), B., 373.  
heating of, (P.), B., 2, 374.  
apparatus for, (P.), B., 85, 915, 1061.  
use of impure vapours for, (P.), B., 452.  
apparatus for heating or boiling of, (P.), B., 30.  
apparatus for cooling or heating of, (P.), B., 662.  
heat exchangers for, (P.), B., 405.  
heating and mixing of, (P.), B., 533.  
heat transmission to, in pipes, B., 787.  
evaporation of, (P.), B., 822.  
prevention of, from tanks, (P.), B., 965.  
double distillation of, (P.), B., 164.  
mixing of, (P.), B., 87, 1013.  
apparatus for, (P.), B., 4, 244, 1108.  
with gases, (P.), B., 87.  
apparatus for, (P.), B., 325.  
with solids, (P.), B., 916.  
with powdered solids, (P.), B., 405.  
apparatus for mixing or agitation of, (P.), B., 212.  
optical properties of, produced by high-frequency sound waves, A., 900.  
subjected to sound waves, A., 799.  
temperature coefficients of refractivity of, A., 1105.  
diffraction of X-rays by, A., 12, 986.  
rotation of, A., 678.  
rotatory magnetic polarisation of, A., 111.  
Raman effect in, A., 793.  
apparatus for irradiation of, (P.), B., 945.  
heat developed in, by absorption of radiation, A., 470.  
electric discharge in, A., 1097.  
pure, electrical conductivity of, A., 899.  
high-frequency conductivity of, A., 899.  
photo-electric effect of, A., 793.  
dielectric constants of, A., 214, 322, 560, 794.  
magnetic susceptibility of, A., 216, 795.  
determination of latent heat of vaporisation of, A., 115.  
surface energy and heat of vaporisation of, A., 799.  
cryoscopy of, for purity, A., 996.  
measurement of density of, (P.), B., 244, 293, 788.  
apparatus for, in vacuum pans, etc., (P.), B., 5.  
relation between surface tension and density of, and density of the saturated vapour, A., 1195.  
viscosity of, A., 14.  
theory of, A., 116.  
determination of, (P.), B., 373.  
adsorption of vapours on interfaces of, A., 690.  
capillary flow of, under high pressures, B., 867.  
capillary rise of, between parallel plates, A., 112, 803.  
adhesion tension of, against solids, A., 690.  
preferential wetting of solids by, B., 1107.  
influence of common solute on mutual solubility of, A., 16.  
critical mixtures of, as colloidal emulsions, A., 801.  
dispersion of undamped waves in, A., 214.

**Liquids, dispersion of gases in**, A., 1085.  
 effect of walls on aggregation of, A., 800.  
 breaking up of foam on, (P.), B., 629.  
 fluctuations in rising mixtures of gases and, B., 324.  
 topochemical change of solids in, A., 22.  
 apparatus for constant flow of, A., 246.  
 controlled distribution of, (P.), B., 789.  
 design of contact apparatus for, B., 963.  
 contact apparatus for gases and, B., 707; (P.), B., 164, 293, 454, 789.  
 drawing-off of, from sediments, etc., (P.), B., 916.  
 bubble tray for, (P.), B., 373.  
 vessels for treatment of, (P.), B., 756.  
 countercurrent treatment of, (P.), B., 1108.  
 addition of reagents to, in pipes, (P.), B., 580.  
 spraying of, (P.), B., 454.  
 apparatus for, (P.), B., 965.  
 removal of, from materials having many capillary spaces, (P.), B., 133.  
 separators for, (P.), B., 165, 965.  
 separation of, from gases, (P.), B., 87, 581, 822.  
 from solids, (P.), B., 3, 821, 868.  
 by vacuum cooling, (P.), B., 1108.  
 apparatus for, (P.), B., 485.  
 worm presses for, (P.), B., 1013.  
 from suspended matter, (P.), B., 3.  
 of different density, automatic regulation of mixture of, (P.), B., 5.  
 separators for, (P.), B., 868.  
 analysis of, by oxidation, A., 72.  
 determination in, of adsorbed gases, (P.), B., 213.  
 of dissolved volatile solvents, A., 763.

**Liquids, anisotropic.** See under Anisotropic.

**crystalline.** See Crystalline liquids.

**dielectric.** See Dielectric liquids.

**dipole, dielectric properties of**, A., 983.  
 absorption of shorter wave-length electric waves by, A., 214.  
 association in, A., 561.  
 explosive, determination of carbon and hydrogen in, A., 1051.  
 finely-divided, separation of, from gases, (P.), B., 51.  
 inflammable, propagation of flames along surface of, A., 233.  
 mixed, refractive index of, A., 222.  
 influence of cellulose nitrate on refraction of, A., 222.  
 Faraday effect in, A., 678.  
 magnetic rotation of, A., 794.  
 diamagnetism of, A., 10, 112, 216, 678.  
 application of Trouton's rule to, A., 567.  
 osmosis of, A., 119.  
 equilibria in, A., 1197.  
 separation of, with solvents, (P.), B., 1108.  
 binary, distillation of, A., 456.  
 dielectric constants and molecular polarisation of, A., 110.  
 vapour pressure of, A., 687, 1083.  
 heterogeneous ternary, distillation of, A., 687.  
 immersion, refractive power of, A., 561.  
 non-Newtonian, slippage of, A., 119.  
 non-volatile, volume-temperature-pressure relations of, A., 684.  
 organic, ultra-violet magneto-optical dispersion of, A., 323.  
 dielectric constants of, A., 447.  
 specific heat of, A., 905.  
 evaporation rates of, B., 331.

**Liquids, organic, capillarity of**, between parallel plates, A., 993.  
 detection of oxygen in, A., 762, 954.  
 polar, dispersion of, for radio-frequencies, A., 899.  
 semi-conducting, influence of electrodes on conductivity of, A., 699.  
 streaming, orientation and deformation of disperse particles in, A., 1201.  
 supercooled, crystallisation of, A., 796, 817.  
 transparent, apparatus for optical examination of, (P.), B., 1109.  
 under-cooled, A., 217.  
 viscous, boiling of, (P.), B., 4.  
 volatile, scrubbing towers for recovery of, B., 627.  
 apparatus for spectroscopic analysis of, (P.), B., 822.

**Liquid films.** See under Films.

**Lithiophilite from Portugal**, A., 494.  
 artificial formation of, A., 39.

**Lithium, isotopic constitution and atomic weight of**, A., 209.  
 valency forces in, A., 1.  
 nuclear spin and magnetic moment of, A., 1183.  
 angular momentum of nucleus of, A., 1.  
 production of recoil nuclei from, A., 672.  
 disintegration of, by swift protons, A., 556.  
 magnetic rotation spectrum and heat of dissociation of, A., 1.  
 nuclear  $\gamma$ -rays from, by excitation with  $\alpha$ -rays of polonium, A., 210.  
 excitation potential of, A., 316.  
 latent heat of vaporisation of, A., 698.  
 molten, use of, in gas-analysis, A., 1221.  
 vapour, physical properties of, A., 454.  
 use of, in synthesis of methylnaphthalenes, A., 507.

**Lithium compounds, complex**, A., 124.

**Lithium salts, infra-red water absorption bands in solutions of**, A., 675.

**Lithium aluminate**, A., 356.  
 carbonate, dissociation of, A., 468.  
 chloride, transference numbers of, A., 342, 914.  
 effect of, on surface tension of aqueous ethyl alcohol, A., 992.  
 solubility of, A., 117.  
 heat capacity of aqueous solutions of, A., 696.  
 equilibria of, with cupric and nickel chlorides and water, A., 697.  
 compounds of, with cobalt chloride, A., 811.  
 ferrite, A., 217.  
 fluoride, fusion curve of, with aluminium fluoride, A., 810.  
 fluoroborate, A., 582.  
 halides, complex compounds of ethylamine and propylamine with, A., 124.  
 hydride, isotope effect in band spectrum of, A., 1, 667.  
 crystal structure of, A., 326.  
 quantum mechanics of, A., 667.  
 reaction of, with benzoyl chloride, A., 846.  
 hydroxide, crystal structure of, A., 326.  
 nitrate, f.p. of solutions of, A., 912.  
 vapour pressure of aqueous solutions of, A., 1083.  
 equilibrium of, with thallous nitrate, A., 574.  
 nitride, heat of formation of, A., 470.  
 peroxide, thermal dissociation of, A., 468.  
 orthophosphate, crystal structure of, A., 986.

**Lithium sulphate, heat of dilution of**, A., 23.  
 bismuth sulphates, A., 32.

**Lithium organic compounds, preparation of**, A., 728.  
 use of, in synthesis of lead aryls, A., 1148.  
 Lithium cyanamide, A., 238.

**Lithium detection and determination:—**  
 distinction between strontium and, by flame test, A., 1103.  
 determination of, and its separation from magnesium, A., 825.

**Lithium ions, equivalent conductance of**, A., 914.

**Lithobiliary acids, and their derivatives**, A., 1248.

**Lithographic transfers, coloured**, (P.), B., 769.

**Lithopone, manufacture of**, (P.), B., 118, 517, 650, 687, 807, 901.  
 fine-textured, production of, (P.), B., 736.  
 high in zinc sulphide, manufacture of, (P.), B., 687.  
 light-resistant, (P.), B., 736.  
 preparation of, (P.), B., 391.

**Liver, isolated cells of**, A., 428.  
 function of, A., 1158.  
 excretory function of, A., 640.  
 secretory function of, A., 534.  
 autolysis of, A., 1063.  
 exclusion and utilisation of, A., 874.  
 activation of anaerobic fermentation in, A., 298.  
 effect of colloidal sulphur on oxidation by, A., 775.  
 oxidation of oxyproline and proline by, A., 775.  
 permeability of, A., 85.  
 inhibition of retention of dyes by, A., 1285.  
 aldehyde of, A., 303.  
 degradation of carbohydrates and fats in, A., 188.  
 inhibitory action of organic compounds on esterase of, A., 543.  
 deposition of fat in, A., 874.  
 significance of glycogen in function of, A., 538.  
 production of glycogen in, by bile acids, A., 639, 644.  
 increase of glycogen in, on feeding with glyceraldehyde, methylglyoxal, and pyruvic acid, A., 645.  
 effect of organic acids on deposition of glycogen in, A., 1160.  
 formation of glycogen from lactic acid in, A., 86.  
 effect of yeast on glycogen in, A., 421.  
 effect of vitamin-B deficiency on glycogen content of, A., 547.  
 glycogen and water storage in, A., 765, 766.  
 lipins of, A., 959.  
 fatty acids from phosphatides of, A., 958.  
 effect of diet on proteins of, A., 876.  
 influence of drugs on mobilisation of sugar in, A., 647.  
 excretion of urea by, A., 639.  
 influence of, on carbohydrate metabolism, A., 961, 1057.  
 on elimination of phenols from blood, A., 962.  
 blood-fat and lipins in injury to, A., 81.  
 disease, blood-lactic acid in, A., 536, 1279.  
 cholesterol in blood-plasma in, A., 1057.  
 crystalline derivative of acid in, A., 186.  
 manufacture of physiologically active substances from, (P.), B., 657.  
 fetal, of vertebrates, mineral elements of, A., 1153.

Liver, frog's, action of adrenaline and glycogen mobilisation in, A., 188.  
human, vitamin-A in, A., 1293.  
mammalian, unsaponifiable fraction of, A., 294.  
sheep's, vitamin-C content of, A., 887.  
toad's, nitrogenous extractives of, A., 299.  
effect of alkaloids on sugar mobilisation from adrenaline in, A., 646.  
Liver extracts, potency of, A., 296.  
effect of, on liver metabolism, A., 1171.  
for secondary anaemia, manufacture of, (P.), B., 704.  
Liver oils of animals, detection of vitamin-A in, A., 656.  
Lixiviation apparatus, (P.), B., 964.  
Lizard, giant. See *Varanus salvator*.  
Lobelia alkaloids, A., 68; B., 240.  
*Lobelia inflata*, effect of fertilisers on growth and alkaloid content of, A., 313.  
Lobeline, pharmacological detection and determination of, A., 88.  
Lobinine, and its salts and derivatives, A., 68.  
Lobinol, salts of, A., 68.  
Lobinone, derivatives of, A., 68.  
Locusts, ash content of, A., 871.  
Locust trees, spray insecticide for control of borer in, B., 812.  
black, effect of, on soil nitrogen and growth of catalpa, B., 618.  
Lodal, synthesis of, A., 843.  
Löllingite, crystal structure of, A., 682.  
Loesses, Russian, composition of, A., 1230.  
Logarithmic sector, Schwarzschild relation applied to, A., 668.  
Logwood, determination of degree of oxidation of extracts of, B., 1073.  
Loretine, microchemical reactions of, A., 1270.  
Lubricants, (P.), B., 93, 220, 459, 492, 539, 762.  
manufacture of, (P.), B., 636.  
adherence of, to metals, B., 27.  
emulsification of, (P.), B., 413.  
use of castor oils as, B., 233.  
insoluble in organic solvents, A., 1106.  
Lubricating greases, manufacture of, B., 1090.  
petroleum, flow of, B., 376.  
Lubricating oils, (P.), B., 877, 971.  
manufacture of, (P.), B., 10, 93, 220, 250, 413, 492\*, 636, 715.  
from Surakhani crude oils, B., 872.  
by hydrogenation, (P.), B., 93, 589.  
production, selection, and application of, B., 489.  
extraction of, (P.), B., 715.  
yield of, from Estonian shale oil, B., 88.  
reclaiming of, (P.), B., 831.  
refining of, (P.), B., 459, 971.  
centrifugal apparatus for cleaning of, (P.), B., 372.  
cooling apparatus for, (P.), B., 821.  
removal of colloidal matter from, (P.), B., 971.  
decolourisation of, (P.), B., 971.  
dewaxing of, B., 969.  
with methylene chloride, B., 825.  
contact filtration of, B., 969.  
treatment of, (P.), B., 588.  
in internal combustion engines, (P.), B., 250.  
vacuum distillation of, B., 825.  
imparting green fluorescence to, (P.), B., 971.  
properties of, B., 873.  
fall in viscosity of, on dilution, B., 53, 632.

Lubricating oils, preparation of crude oil for, (P.), B., 831.  
utilisation of acid sludge from, B., 489.  
cleaning of surfaces coated with sludges of, (P.), B., 877.  
with colloidal admixtures, B., 297.  
effect of, on cancer, A., 1277.  
for automobiles, B., 710.  
from Binagadi, treatment of, with liquid sulphur dioxide, B., 969.  
from crank-cases, purification of, (P.), B., 589.  
from cylinders, purification of, (P.), B., 588.  
dyed and scented, (P.), B., 11.  
fatty, ageing of, B., 313.  
fluorescent, manufacture of, (P.), B., 927.  
high-sulphur, manufacture of, (P.), B., 1019.  
of low pour point, manufacture of, (P.), B., 137.  
motor, filters for reclamation of, (P.), B., 1070.  
incorporation of graphite with, B., 247.  
evaluation of, B., 1016.  
paraffin-base, for internal combustion engines, B., 169.  
prediluted, (P.), B., 831.  
used, recovery of, B., 457, 969; (P.), B., 927, 971.  
apparatus for testing of, (P.), B., 715.  
colorimetry of, B., 632, 760.  
determination of acidity of, with alkali-blue 6B, B., 489.  
determination of iodine value of, B., 1016.  
Lubrication, orientation of molecules in relation to, A., 460.  
with colloidal graphite, B., 1110.  
Lucerne (*alfalfa*), effect of lime, superphosphate, and potash on growth and composition of, B., 440.  
lime and phosphoric acid content of, A., 549.  
control of the pea aphid in, B., 570.  
influence of soil temperature and moisture on wilt in, B., 1047.  
physiological effect of, as diet, A., 299, 423.  
Lucicoline, A., 178.  
hydrochloride, A., 629.  
Lucidusculine, A., 178.  
and its salts and derivatives, A., 629.  
Luciferin, crystalline, A., 871.  
Ludwig-Soret effect, theory of, A., 123.  
Lumbricus, mol. wt. of blood-pigment of, A., 1151.  
Luminal, colour reactions of, B., 863.  
Luminescence, relation between types of, A., 793.  
Luminescent compounds, A., 352, 559.  
*epi-isoLumisterol*, and its acetate, A., 381.  
Lumisterols, and their acetates, A., 381.  
Lunacrine, A., 101.  
*Lunasia amara*, alkaloids of, A., 101.  
Lunasine, A., 101.  
Lungs, concretions in, A., 873.  
Lupene, A., 1245.  
Lupeol, dehydrogenation of, and its derivatives, A., 1245.  
Lupins, utilisation of atmospheric nitrogen by seeds of, A., 436.  
nitrogen metabolism of, A., 202.  
alkaloids in, A., 664.  
yellow, chlorosis in, B., 125.  
Lupin alkaloids, A., 178.  
Lupinic acid, methyl ester, derivatives of, A., 178.  
Lupinine, structure and derivatives of, A., 178.

Lupininhydrazide, A., 178.  
*Lupinus albus*, germination and development of, A., 887.  
effect of pituitary hormones on germination of, A., 433.  
respiratory quotient of, A., 783.  
production of carbon dioxide by germinating seeds of, A., 1177.  
effect of carbon monoxide on oxygen consumption by seeds of, A., 974.  
*Lupinus barbigier*, sparteine from, A., 664.  
*Lupinus luteus*, effect of iron on chlorosis of, B., 907.  
Lusitanicoside, A., 662.  
Lustre-meter, A., 137.  
Lutecium, spectra of, A., 440.  
*Lychnis gilghago*. See Corn-cockle.  
*Lychnis viscaria*, sugars of gum of, A., 575.  
Lycopenal, and its oxime, A., 749.  
Lycopene, isolation of, from *Dimorphoteca aurantica*, A., 1257.  
in tropical fruits, A., 1178.  
hydrogenation of, A., 619.  
oxidation of, A., 749.  
Lycopin, A., 203.  
Lycopodium, collection and yield of, B., 287.  
*Lycoris squamigera*, carbohydrates of bulbs of, A., 202.  
Lyes, household, germicidal efficiency of, A., 1067.  
Lymph glands. See under Glands.  
Lymphocytes, proteolytic enzymes of, A., 536.  
Lysimeters, applications of, A., 829; B., 952.  
Lysine, compounds of, with cupric chloride, A., 257.  
Lysozyme, effect of, on tuberculosis, A., 770.  
Lysol, poisoning by. See under Poisoning.  
Lysolecithin, formation of, from egg-yolk lecithin, A., 1064.  
*Lytta adspersa*, determination of cantharidin in, B., 47.  
4-*d*-Lyxotetrahydroxybutylglyoxaline, and its derivatives, A., 369.

## M.

M-M-M alloy, thermal expansion of, B., 149.  
*Macacus rhesus*. See Monkeys.  
Macadam, tarred, apparatus for mixing of, (P.), B., 629.  
Macaroni, determination of acidity of, B., 365.  
Mackerel, constituents of, A., 871.  
Maclurin, production of, from acacatechin, A., 651.  
*Macrocystis pyrifera*, carbohydrate hydrogensulphate of, A., 203.  
Magaki. See Oysters.  
Maggot, cabbage. See *Phorbia brassicae*.  
Magma, volatile constituents in, A., 829.  
Magnesite, effect of iron oxide on dead-burning of, B., 384.  
production of fertilisers from, (P.), B., 935.  
Bakal, A., 1015.  
dead-burned, souring of, B., 936.  
Magnesium, production of, from dolomite and magnesite, B., 986.  
from its oxide, (P.), B., 189, 1123.  
electrolytically, (P.), B., 68, 473, 558.  
by electro-thermal reduction of its compounds, (P.), B., 232.  
in France, B., 349.

**Magnesium**, continuous production of, (P.), B., 151.  
 electrolytic extraction of, from carnallite, B., 387.  
 in the solar spectrum, A., 315.  
 purification of, by sublimation, (P.), B., 472.  
 and its alloys, refining of, for casting, (P.), B., 803.  
 casting of, B., 1122; (P.), B., 557.  
 and its alloys, (P.), B., 609, 685, 775.  
 and its alloys, production of forgings of, (P.), B., 267.  
 and its alloys, rolling of, (P.), B., 557.  
 viscosities of fluxes and slags in smelting of, B., 774.  
 spectrum of, A., 207.  
 arc spectrum of, A., 315.  
 ultra-violet spectrum of, A., 891.  
 photo-electric effect at surfaces of, A., 788.  
 heat of formation of, A., 470.  
 heat of formation of compounds of, with lanthanum, A., 575.  
 crystals, physical properties of, A., 681.  
 solubility of aluminium in, in the solid state, B., 429.  
 solubility of manganese in, A., 801.  
 films, photo-electric properties of, A., 789.  
 corrosion of, in salt solutions, A., 30.  
 prevention of, (P.), B., 609.  
 and its alloys, protection of, against corrosion, (P.), B., 990, 1123.  
 in internal combustion engines, etc., (P.), B., 1087.  
 and its alloys, electroplating of, with zinc, (P.), B., 68.  
 thermochemistry of action of water on, A., 238.  
 fertilising action of, B., 567.  
 rôle of, in agriculture, B., 395.  
 effect of, on growth of rats, A., 300.  
 absorption, serum concentration, and narcotic effects of, A., 774.  
 deficiency of, in animals, A., 773.  
 antagonism of calcium to physiological action of, A., 302.  
 colour reactions of, A., 588.  
**Magnesium alloys**, treatment of, (P.), B., 111.  
 forging of, (P.), B., 472.  
 age-hardening of, B., 109.  
 protective coating of, with selenium, etc., B., 511.  
 utilisation of, A., 686.  
 treatment of welded structural materials from, (P.), B., 472.  
 anti-friction, B., 681.  
 binary, B., 941.  
 with aluminium, A., 685.  
 production of, by electrolysis, A., 478.  
 degassing of, (P.), B., 1123.  
 with aluminium and copper, A., 989.  
 with aluminium and silicon, A., 907.  
 with beryllium, manufacture of, B., 941.  
 with tin and zinc, (P.), B., 847.  
**Magnesium compounds**, absorption of, in dogs, A., 190.  
**Magnesium salts**, dehydration of, (P.), B., 421.  
 effect of, with carotene, on growth of rats, A., 963.  
**Magnesium carbonate**, production of, (P.), B., 1119.  
 effect of heat with water on, A., 697.  
 solubility of, in carbon dioxide-free water, A., 457.  
 effect of, in diet of growing chicks, A., 773.  
 basic, promoter action of, in catalysis, A., 1004.

**Magnesium hydrogen carbonate**, and its mixtures with calcium hydrogen carbonate, decomposition of, by heat, A., 234.  
*perchlorate hydrates*, A., 1216.  
 chloride, anhydrous, preparation of, B., 382.  
 and its hydrates, A., 1099.  
 production of, (P.), B., 641.  
 production of, from dolomite, (P.), B., 227.  
 separation of, from calcium chloride, (P.), B., 1078.  
 removal of oxychloride from, (P.), B., 886.  
 transport number of, A., 812.  
 dehydration of, (P.), B., 885.  
 equilibrium of, with calcium chloride and water, A., 1091.  
 with potassium and sodium chlorides, A., 1205; B., 259.  
 production of the oxide and hydrochloric acid from, B., 61.  
 chloride and oxide, equilibrium of, with water, A., 913.  
*orthogermanate* and *orthosilicate*, conductivity, diffusion, and reactivity of, A., 985.  
 hydroxide, effect of, on oxidation of quinol, A., 578.  
 for use in petroleum industry, B., 1112.  
 iodate, equilibrium of, with sodium iodate and water, A., 341.  
 nitrates, heat of dilution of, A., 913.  
 solubility of, in water, A., 573.  
 solubility of mixed crystals of nickel nitrate and, A., 1084.  
 hydrated, production of, (P.), B., 1078.  
 nitrate and sulphate, heats of dilution of, A., 23.  
 nitride, production of, (P.), B., 22.  
 density and crystal structure of, A., 797.  
 oxide (*magnesia*), production of, from dolomite, (P.), B., 505, 934.  
 from the chloride, B., 144.  
 X-ray examination of minerals of zirconium oxide and, B., 229.  
 specific heat of, at high temperatures, A., 328.  
 reduction of, by silicon, A., 481.  
 production of tablets of, (P.), B., 723.  
 use of apparatus of, in analysis, A., 358.  
 impervious crucibles of, A., 593.  
 light and heavy, B., 304.  
 oxychloride, A., 822.  
 phosphate, A., 583.  
 hydrogen phosphate, manufacture of, (P.), B., 261, 506.  
*metasilicates*, thermochemistry of, A., 1092.  
 sulphate, titration of, using fluorescein, A., 923.  
 sulphides, A., 1098.  
 calcium hydrogen sulphite, production of, from magnesian rock, (P.), B., 724.  
 titanate, manufacture of, (P.), B., 1078.  
**Magnesium organic compounds**, reducing action of, A., 1250.  
**Magnesium acetylenyl bromide**, reaction of, with azides, A., 172.  
 alkoxides, mixed, and their molecular compounds, A., 1240.  
*p*-anisyl bromide, action of, on dimethylphenylacetamide, A., 745.  
 benzyl chloride, reactions of, A., 385, 410.  
 bornyl chloride, reducing action of, A., 165.  
 bromides, action of  $\alpha$ -olefinic bromides on, A., 41.

**Magnesium organic compounds**:  
**Magnesium isobutyl bromide**, formation of, A., 1016.  
 crotyl bromide, allylic rearrangement of, A., 250.  
 2-furyl iodide, preparation of, A., 399.  
 halides, reaction of, with  $\alpha$ -bromo-ketones, A., 616.  
*cyclohexyl* halides, action of, on benzophenone, A., 1250.  
 iodide alkoxides, molecular compounds of, with ketones, A., 1240.  
 phenyl bromide, reaction of, with *N*-chloro-compounds, A., 862.  
 reaction of, with triarylmethyl halides, A., 1240.  
 pyrrole, derivative of, by reaction with trioxymethylene, A., 1261.  
 triarylmethyl bromides, syntheses with, A., 848, 1024.  
 triphenylvinyl bromide, A., 762.  
**Magnesium detection, determination, and separation**:—  
 detection of, A., 489.  
 determination of, colorimetrically, in presence of phosphates, A., 1223.  
 electrometrically, with the antimony electrode, A., 826.  
 after decomposition by hydrofluoric acid, A., 136.  
 with 8-hydroxyquinoline, A., 489.  
 iodometrically, in organic liquids, A., 35.  
 microchemically, in biological material, A., 1182.  
 volumetrically, A., 826.  
 in blood, A., 764.  
 in blood-serum, A., 531.  
 in presence of calcium, A., 1103.  
 in calcium oxalate, A., 243.  
 in urine, A., 767, 1056.  
 and its separation from calcium, A., 588.  
**Magnesiylphenylurethane**, syntheses with, A., 1025.  
**Magnesiylpyrroles**, syntheses by means of, A., 753.  
**Magnets**, permanent, steel for, (P.), B., 151.  
**Magnetic articles**, production of, (P.), B., 734.  
 birefringence, A., 677.  
 variation of, with temperature in fused organic substances, A., 561.  
 and molecular anisotropy, A., 678.  
 anomalous dispersion of, A., 900.  
 of fused aromatic compounds, A., 215.  
 cores, (P.), B., 232.  
 manufacture of, (P.), B., 69, 993.  
 alloy for, (P.), B., 1123.  
 iron-nickel alloys for, (P.), B., 388, 683.  
 for electrical apparatus, (P.), B., 353.  
 insulated, production of, (P.), B., 351.  
 materials, reversible processes in, A., 1191.  
 for seed sorting, (P.), B., 559.  
 moments in relation to periodic system, A., 678, 679.  
 of paramagnetic salts, A., 900.  
 nuclear, A., 1072.  
 oscillators, atoms and molecules as, A., 10.  
 permeability of wires, A., 449.  
 rotation. See under Rotation.  
 sands, reduction of, B., 108.  
 saturation, A., 449.  
 susceptibility, influence of light on, A., 900.  
 of compounds, A., 795.  
 of complex compounds, A., 10, 678.  
 of liquids, A., 216, 795.  
 of metals, A., 12.

- Magnetisation and thermal potential**, A., 324.
- Magnetism and valency**, A., 324.  
effect of variation of molecular field on, A., 901.  
effect of temperature on hysteresis loops in, A., 13.  
effect of plastic deformation of, A., 1080.  
of free electrons, A., 670.  
of organic substances, A., 16.  
See also Diamagnetism.
- Magnetite**, magnetic properties of, A., 900.  
transformation of, at low temperatures, A., 1078.
- Magnetochemistry**, A., 10, 216, 985.
- Magneto-optical effect**, A., 794.
- Magnetophoretic effect**, A., 21.
- Magneto-resistance and magneto-strain**, A., 327.
- Magneton**, Hull, A., 327.
- Magnetostriction**, A., 565.  
hysteresis effects in, A., 114.
- Magnifera indica*. See Mango.
- Magnus' salts**, A., 215.
- Maguay plant**, juice of, A., 662, 976.
- Maize**, biochemistry of grains of, A., 548.  
nutrition of, in sand cultures, A., 438.  
effect of calcium deficiency on roots of, A., 666.  
effect of fertilisers and date of planting on development of, B., 200.  
effect of fertilisers on chlorine content of sap of, A., 1181.  
nutritive value of proteins of, A., 189.  
variations in vitamin-A in, A., 433.  
yeast and casein supplements to diet of, A., 643.  
food products, etc., from by-products of milling of, (P.), B., 446.  
preparation of cellulose from stalks of, B., 222.  
injury to, from *Penicillium*, A., 438.  
"sand-drown" disease of, in relation to lime and magnesia in soil, B., 569.  
European, control of borer in, B., 277.  
yellow dent, treatment of seed of, B., 441.  
determination of soil fertiliser requirement by testing of stalks of, B., 568.  
determination of composition of tissues of, from expressed sap, A., 1180.  
determination in, of glucose and fructose, A., 437.
- Maize meal**, energy value of, A., 423.  
butyl-acetone fermentation of, B., 814.  
cooked, feeding of pigs with, B., 958.
- Maize oil**, effect of, on butter and milk production, A., 1155.
- Maize silage**, feeding value of, and its effect on cows' milk, B., 283.  
starch equivalent of, B., 205.
- Maize syrup**, viscosity of, B., 1132.
- Malachite**, crystal structure of, A., 682.
- Malachite-green**, hydrogenation of, A., 1114.
- Malaikmo wood**, composition of, B., 385.
- Malaria**, action of ethyl urethane and quinine in, A., 88.
- Maleamic acid**, salts of, A., 252.
- Maleic acid**, constitution of, and its esters and their salts, A., 252.  
or its anhydride, manufacture of, (P.), B., 763.  
methyl ester, isomerisation of, A., 816.
- Maleic anhydride**, addition of, to *as*-di-phenylethylene, A., 56.  
compounds of, with elaeostearic acids, A., 1018.  
with methyl and ethyl abietates, A., 1254.
- Malic acid**, formation of, in *Crassulaceae*, A., 312.  
in alcoholic fermentation, A., 1288.  
by moulds, A., 1168.  
and its derivatives, equilibria of, with tartaric acid and its derivatives, A., 340, 469, 810.  
determination of, in tobacco, B., 703.
- r*-Malic acid**, ferrous salt, A., 42.
- l*-Malic acid**, equilibria of, with *d*- and *l*-phenylglycolic acids, A., 1205.
- Malnutrition**, growth and retention of calcium, nitrogen, and phosphorus on recovery from, A., 768.
- Malonamylidides**, A., 938.
- Malonic acid**, condensation of, with succin-dialdehyde and methylamine, A., 741.  
synthesis of  $\alpha$ -unsaturated acids from, A., 1129.  
ferrous salt, A., 42.  
esters, surface tension of, A., 985.  
ethyl isomyl ester, A., 1018.  
ethyl ester, sodium derivative, action of arsenic chloride on, A., 151.  
*p*-phenylphenacyl ester, A., 745.  
determination of, refractometrically, A., 632.
- Malonic acid**, amino-, benzoyl derivative, ethyl ester, A., 150.  
oximino-, acetyl derivative, ethyl ester, A., 727.
- Malonic acids**, alkylated, thermal stability of, A., 366.
- Malt**, solubility of nitrogen in mashings of, B., 957.  
roasting of, for colouring beer, B., 43.  
amylases of, A., 649.  
influence of electrical treatment on diastatic activity of, B., 75.  
germs, peptidase distribution in, A., 304.  
barley, action of enzymes of, on cellulose glycol ether, A., 304.  
barley and oat, mashing of, B., 572.  
coloured, analysis of, B., 126.  
"sinker" test for, B., 814, 1051.  
analysis and diastatic activity of, B., 572.  
use of Zeiss immersion refractometer in analysis of, B., 1132.
- Malt extracts**, fractionation of proteins of, B., 320.  
and malted sweets, B., 1004.  
determination of, B., 699.
- Malt kilns**, determination of moisture in, B., 699.
- Maltase of leucocytes**, A., 956.
- Malting**, laboratory equipment for, B., 1102.
- Maltobionic acid**, enzymic hydrolysis of, A., 1165.
- Maltose**, preparation of, for microbiological use, A., 1238.  
ethylmercaptal octaacetate, A., 146.  
determination of, A., 1270.
- Malto-suria**, A., 416.
- Malvenin salts**, synthesis of, A., 1038.
- Malvin chloride**, synthesis of, A., 1140.
- Malvone**, constitution of, and its amide, A., 521.
- Mammary glands**, absorption of milk pre-cursors by, A., 638, 871, 1154.  
active and resting, carbohydrate meta-bolism of, A., 1059.
- Mandarins**, changes in sugars in, during ripening and storage, A., 549.
- Mandelamideacetone**. See 4-Keto-5-phenyl-2:2-dimethyltetrahydro-oxazole.
- Mandelic acid**, from amygdalin, configura-tion of, A., 1246.  
esters, enzymic formation of, A., 776.  
racemic esters, asymmetric hydrolysis of, by esterase, A., 967.
- r*-Mandelic acid**, rotation of aqueous ex-tracts of *d*- and *l*-carvone solutions of, A., 1197.  
solubility of, in *d*- and *l*-carvones, A., 848.
- Mandelic acids**, menthyl esters, rotatory dispersions of, A., 1037.
- Manganates**. See under Manganese.
- Manganese**, recovery of, from low-grade ores, (P.), B., 190.  
*K* X-ray absorption spectrum of, A., 3.  
potential of, A., 470.  
magnetic properties of, in solid solutions, A., 679.  
solubility of, in magnesium, A., 801.  
in mercury, A., 457.  
equilibrium of, with iron oxide, A., 125, 811.  
oxidation of, by bacteria, A., 307.  
reduction of, in blast furnaces, B., 1033.  
in green and etiolated leaves, A., 665.  
effect of, on growth of plants, A., 205.  
in foods, B., 285.  
content of, in milk, A., 78.  
physiological significance of, in organisms, A., 78.  
effect of, on growth and haemoglobin synthesis, A., 1052.
- Manganese alloys with aluminium**, A., 116.  
with carbon, shrinkage of, on solidifi-cation, B., 109.  
with iron, A., 455.  
potential of, A., 1092.  
with iron and nickel, (P.), B., 1086.  
with mercury and with silver, A., 470.  
with nickel, ferromagnetism of, A., 15.  
with zinc, A., 116, 1196.
- Manganese salts**, effect of, on acidimetric titrations, using methyl-orange, A., 1220.
- Manganese carbonate**, dissociation of, A., 1204.  
nitride, ferromagnetism of, A., 216.  
dioxide, production of, electrolytically, B., 979, 1028.  
thermal dissociation of, A., 228.  
adsorption of ionium by, A., 17, 1199.  
for dry cells, B., 431.  
colloidal, coagulation of, A., 805.  
electrolytic, B., 991.  
oxides, A., 468.  
crystalline, dissociation of, A., 1204.  
natural, microscopy of, A., 1106.  
silicate, mixed crystals of calcium silicate and, A., 1197.  
equilibrium of, with iron silicate, A., 997.  
sulphochromite, spinel structure of, A., 114.
- Manganous hydroxide**, oxidation of, A., 32.  
oxide, adsorption of carbon monoxide by, A., 991.  
nitrate, decomposition of, A., 823.  
hexahydrate, equilibrium of, with nickelous nitrate hexahydrate, A., 1198.  
sulphate, equilibrium of, with thorium sulphate and water, A., 1091.  
reduction of permanganate with, A., 823.  
titration of, using fluorescein, A., 923.  
anhydrous and hydrated, A., 32.  
ammoniates, A., 350.  
sulphide, rose, change of, to green, A., 1219.
- Manganates**, analysis of mixtures con-taining permanganates and, A., 1223.
- Permanganates**, production of, from man-ganese dioxide, B., 598.  
reduction of, with manganous sulphate, A., 823.  
determination of, in presence of manganates, A., 35.



**Manganese detection, determination, and separation**—  
 detection of, in presence of chlorides, A., 243.  
 determination of, A., 136.  
   colorimetrically, with benzidine, A., 243.  
   with potassium periodate, A., 136.  
   as oxide, A., 1104.  
   using zinc oxide, A., 137.  
   in natural carbonates, B., 382.  
   iodometrically, in presence of chromium, A., 491.  
   in presence of chromium and vanadium, A., 36.  
   in ferrous products, A., 491.  
   as permanganate, A., 590.  
   colorimetrically, in plants, B., 568.  
   in rocks, A., 1229.  
   in rubber fillers and textiles, B., 119.  
   spectroscopically, in steel, B., 891.  
 separation of, by precipitation as dioxide, A., 136.  
 **$\alpha$ - and  $\beta$ -Manganese, magnetic susceptibilities of, A., 985.**  
**Manganese ores, dressing of, B., 1084.**  
   leaching of, (P.), B., 896.  
   of N. Carolina, A., 1228.  
**Manganese spar, dissociation of, A., 1204.**  
**Manganite, natural, microscopy of, A., 1106.**  
**Mangels, changes in composition of, during storage, B., 285.**  
**Mango fruit, carotene in, A., 1178.**  
**Mangostin, A., 64, 397, 855.**  
**Manioc for brewing, B., 204.**  
**Mannitol, X-ray structure of, A., 904.**  
   peptisation of ferric hydroxide or calcium carbonate by, A., 19.  
   action of bacilli on, A., 1290.  
   reactions of, A., 718.  
   dibenzoate, constitution of, A., 598.  
   and 1:6-dichloro-, 2:3:4:5-tetrabenzoates of, A., 834.  
   complex ferric compounds of, and their autoxidation, A., 362.  
   triphenyl methyl ether, A., 42.  
***d*-Mannitol, crystal structure of, A., 327.**  
***β*-de-tetrabenzoate, A., 929.**  
***dl*-Mannitol, synthesis of, A., 718.**  
**Mannitoldiboric acid, A., 723.**  
**Mannoeycitol, tetrahydroxy-. See cyclo-Hexane, 1:2:3:4-tetrahydroxy-.  
*d*-Mannonic acid, preparation of, A., 833.  
 $\gamma$ -Mannonolactones, tetra-acetyl derivatives, A., 44.  
*d*-Mannosaccharic acid, isomerism of, A., 1113.  
**Mannose, X-ray structure of, A., 904.**  
   copper reduction values of, A., 1182.  
   phenylhydrazone and nitrophenylhydrazones, and their optical rotations, A., 147.  
***d*-Mannose, crystal structure of, A., 327.**  
   oxidation of, with ammoniacal copper oxide, A., 45.  
    $\beta$ -phenylethyldiazonane, A., 942.  
**Mannosebenzamidates, A., 148.**  
**Mannosediacetamide, and its benzoyl derivative, A., 148.**  
**Mannuronic acid, salts of, A., 1019.**  
   brucine salt, A., 721.  
***d*-Mannuronolactone, isolation and properties of, A., 1019.**  
   preparation of, A., 367.  
**Manometers for low pressures, B., 243.**  
   absolute, A., 491.  
   McLeod, A., 1226.  
   simple, A., 1014.  
**Manso fino. See Maguay plant.****

**Manures, comparative effects of fertilisers and, B., 124.**  
 artificial, chemical changes in preparation of, B., 695.  
 composted, rates of decomposition of spent mushroom soils and, B., 1047.  
 farmyard, microbiology of decomposition of, in soils, B., 276.  
 effects of fertilisers and, on soils and crops, B., 782.  
 artificial, preparation of, B., 781.  
 green, B., 123, 158.  
   decomposition of, in soils, B., 124.  
   decomposition of nitrogenous substances in, B., 695.  
   fungus diseases and, B., 569.  
   for coconuts, B., 319.  
   for coffee, tea, cacao, or rubber, B., 278.  
   vetch, decomposition of, in soils, B., 566.  
 green and stall, B., 395.  
 horse, as a source of carbon dioxide, B., 653.  
 hot- and cold-fermented, B., 569.  
 organic, preparation of, B., 201.  
 manufacture of, (P.), B., 956.  
 microbiology of, B., 695.  
 peat and straw, losses of ammonia-nitrogen in storage of, B., 201.  
 stall, residual action of, in field trials, B., 395.  
   nitrification of, in arable soils, B., 317.  
   substitutes for, B., 953.  
 See also Fertilisers and Fish guano.  
**Marble, velocity of decomposition of, in acids, A., 1211.**  
 manufacture of slabs in imitation of, (P.), B., 1033.  
 artificial, production of, (P.), B., 107.  
 scagliola, manufacture of slabs, tiles, etc., of, (P.), B., 468.  
**Marcasite, crystal structure of, A., 114.**  
**Margaric acid, *p*-chlorophenacyl ester, A., 744.**  
**Margarine, manufacture of, (P.), B., 435, 526; 1007.**  
   rotary cooling drums for, (P.), B., 292.  
   salting of, B., 861.  
   detection of sesame oil in, B., 30.  
**Marigold, pigment of, A., 785.**  
**Marking-nut. See *Semicarpus anacardium*.**  
**Marls, natural and artificial, B., 691.**  
**Marmelosin, constitution of, and its derivatives, A., 1035.**  
**Marmot fat, B., 734.**  
**Martensite, transition of austenite to, A., 1196.**  
 **$\gamma$ -*n*-Martensite, structure of, A., 797.**  
**Masonry, effect of soluble salts on, B., 1081.**  
 acid-proof, construction of, (P.), B., 345.  
**Mass law, validity of, A., 223.**  
**Masseccutes, crystallisation of, B., 480.**  
   excess of sugar obtained in, by Zamaron process, B., 1131.  
   after-product, addition of water to, B., 40.  
   beet-sugar, crystallisation of, B., 364, 480.  
   low-grade, B., 40.  
   chemical treatment of, B., 956.  
   decomposition of sucrose and glucose in, B., 442.  
**Mastitis, carbohydrate deficiency in, A., 536.**  
**Matches, rôle of bacteria in manufacture of, B., 962.**  
   utilisation in fertilisers of phosphorus waste from, B., 744.  
   repeatedly ignitable, (P.), B., 786.  
**Maté, determination in, of caffeine, B., 367.**

**Materials, genetic development of, A., 131.**  
 mechanical separation of, (P.), B., 294.  
 heat-treatment of, (P.), B., 1107.  
 of different density, sorting of, (P.), B., 580.  
 divided, briquetting of, B., 820.  
 finely-divided, production of, (P.), B., 405.  
   apparatus for measuring fineness of, (P.), B., 916.  
   treatment of, with gases, (P.), B., 3, 581.  
   mixing or spraying of, (P.), B., 868.  
 friable, apparatus for handling of, (P.), B., 54.  
 granular, apparatus for classification of, (P.), B., 661.  
   cooling and drying of, (P.), B., 916.  
   apparatus for cooling and screening of, (P.), B., 405.  
   drying of, (P.), B., 452.  
   drying, heating, cooling, etc., of, (P.), B., 211.  
   apparatus for feeding or charging of, (P.), B., 455.  
   separation of, (P.), B., 372.  
   separation and grading of, (P.), B., 580.  
   apparatus for sorting of, (P.), B., 532.  
   apparatus for washing of, (P.), B., 212.  
   heat flow through, B., 243, 627.  
 opaque, calculation of number and size distribution of spherical crystals in, A., 138.  
 pulverised, separation of, (P.), B., 3.  
 pulverulent, production of lumps of, (P.), B., 1108.  
   separation of, (P.), B., 788.  
 soft lump, apparatus for kibbling of, (P.), B., 453.  
**Matter, activation of, A., 321, 446.**  
 magnetic properties of, in strong fields, A., 565.  
 destruction of, by ultra-radiation, A., 791.  
**Mead, fermentation of, B., 858.**  
**Meadows, manuring of, B., 123.**  
 on low-moor soils, factors affecting yield of, B., 478.  
**Mealworms, fasting, metabolism of. See under Metabolism.**  
**Meat, curing of, (P.), B., 702.**  
   use of sodium nitrite in, B., 399.  
   curing or smoking of, (P.), B., 47.  
   tenderness of, B., 815, 1005.  
   freezing of, (P.), B., 750.  
   preservation of, (P.), B., 816.  
   inhibition of fungi in, by carbon dioxide, B., 1053.  
   inhibition of mould growth on, by carbon dioxide, B., 749.  
   effect of diet of, on hyperthyroidism, A., 95.  
 respiratory metabolism during diet of, A., 83.  
 canned, penetration of heat into, B., 1103.  
   cooked, preparation of, (P.), B., 367.  
   lean, water-protein ratio in, B., 959.  
   detection of decomposition of, B., 815.  
   detection of hydrogen sulphide in determination of freshness of, B., 1134.  
**Meat extract, creatine and creatinine in, B., 701.**  
**Meat industry, application of science in, B., 239.**  
**Meat products, chemical composition of, B., 815.**  
**Meconic acid, diphenylformamidine ester, A., 262.**

- Medicaments**, deterioration of, in light, B., 206.  
German, B., 1135.  
detection in, of primary cyclic amines, B., 972.
- Medicines**, patent, detection of emodin and phenolphthalein in, B., 287.
- Medlars**, Japanese, biochemistry of ripening of, A., 435.
- Mel depuratum**, Fiehe test on, B., 1134.
- Melanogen**, occurrence of, in insects, A., 1154.  
urinary excretion of, in sarcomatous subjects, A., 1277.
- Melanosarcoma**, horse, vitamin-A in, A., 296.
- Melia Azedarach**. See Cedar, white.
- Melibiose**, alkaline degradation of, A., 148.
- Melon seeds**, growth of, in relation to food reserves, A., 661.
- Melting point**, determination of, of small volatile crystals, A., 592.  
effect of particle size on, A., 799.  
of binary systems, A., 340.  
of dissociable compounds, A., 1194.  
of homologous series, A., 799.  
low, salts of, A., 685, 800.
- Melting point apparatus**, A., 36, 592, 713, 1012.
- Membranes**, apparatus for preparation of, A., 492.  
diffusion of gases through, A., 804.  
permeability and polarisation of, A., 691.  
permeability of, in relation to ion distribution, A., 119.  
oxidation-reduction equilibria in, A., 460.  
equilibrium at, in relation to ion distribution, A., 17, 334.  
collodion, adsorption of gelatin by, A., 691.  
mosaic, A., 334.  
non-swelling, abnormal osmosis at, A., 570.  
protein-cellulose, adsorption by, A., 1085.
- Meningococci**, carbohydrate and protein fractions of, A., 884.
- Menoformone**, concentration-action curve for, A., 1068.  
antagonism of, to anterior pituitary hormones, A., 97.  
in blood of male dogs after radium irradiation, A., 781.
- Menthene**, effect of solvents on optical rotation of, A., 448.  
determination of, in peppermint oil, B., 161.
- Δ<sup>3</sup>-Menthene**, manufacture of, (P.), B., 764.
- Δ<sup>1</sup>-p-Menthen-3-one**, 2-bromo-, A., 750.
- Menthol**, preparations from, (P.), B., 960.  
detection of, colorimetrically, B., 400.  
synthetic, determination of, in presence of methyl salicylate in ointments, B., 785.
- dl-Menthol**, resolution of, A., 1139.
- Menthols**, production and purification of, (P.), B., 974.  
antiseptic value and toxicity of, A., 965.
- 1-Menthone**, methylation of, A., 161.
- l-isoMenthone**, in Réunion geranium oil, B., 656.
- Menthyl orthophosphate**, A., 276.  
dixanthide, effect of solvents and temperature on optical rotation of, A., 561.  
hydrolysis and decomposition of, A., 498.
- l-Menthyl triphenyl methyl ether**, A., 255.
- Menthylphosphorous acid**, A., 276.
- Mercaptalactic acids**, fission of, A., 1235.
- Mercaptans**, infra-red absorption spectra of, A., 6.  
autooxidation of, by organic catalysts, A., 704.  
dehydrogenation of, by metals, A., 431.  
in hydrocarbon solution, action of copper compounds on, A., 599.  
additive compounds of, with formaldehyde, A., 1114.  
aliphatic, A., 599.  
identification of, with 1-chloro-2:4-dinitrobenzene, A., 719.  
determination of, iodometrically, in benzene solution, A., 1017.
- Mercaptido-groups**, reactivity of, A., 26.
- Mercaptobenzthiazole**, thixotropy of disperse systems of, A., 911.  
reaction between zinc soaps and, during vulcanisation of rubber, B., 651.  
and its derivatives, analysis of, volumetrically, A., 530.
- 2-Mercaptobenzthiazole**, manufacture of, (P.), B., 764.  
and its methyl homologues, manufacture of, (P.), B., 57.
- Mercaptolacetic acid**, fission of, A., 1235.
- Mercaptotetrazoles**, A., 405.
- Mercaptothiazoles**, synthesis of, A., 68.
- Mercerisation of cotton**, B., 1117.
- Mercerising liquors**, wetting agents for, (P.), B., 338.
- Mercuric salts**. See under Mercury.
- Mercurochrome**, constitution and toxicity of, A., 630.
- Mercurous salts**. See under Mercury.
- Mercury**, isolation of, from its organic derivatives, A., 409.  
hyperfine structure of, A., 552.  
hyperfine structure and nuclear moment of, A., 1072.  
atoms, excitation of, by electrons, A., 442.  
isotopes, nuclear moment of, A., 552.  
detection of an even-numbered isotope of, A., 4.  
isotope displacements of, A., 668.  
extraction of, from its ores, etc., (P.), B., 684.  
purification of, B., 348.  
boilers for, (P.), B., 917, 1060.  
condensation of, from vapours, (P.), B., 894.  
spectrum of, A., 2, 104, 208, 315, 787, 891, 979, 1183.  
polarisation in, A., 2.  
Zeeman effect in, A., 104.  
under high-frequency excitation, A., 2.  
in the electrodeless discharge, A., 892.  
ionised, spectrum of, A., 1183.  
absorption spectrum of, A., 668, 979.  
*L*-absorption spectrum of, A., 788.  
band spectrum of, A., 552.  
band spectrum and fluorescence of, A., 552.  
fluorescence spectrum of, A., 104.  
resonance spectrum of, A., 440, 891.  
polarisation in, A., 315.  
spark spectrum of, A., 104, 440.  
spectrum and nuclear moments of, A., 2, 440.  
fluorescence of, A., 440, 891.  
polarisation of, A., 208.  
light source for resonance radiation in, A., 892.  
afterglow of resonance radiation of, A., 891.  
polarisation of resonance radiation of, A., 891.  
quenching of resonance radiation of, A., 325.
- Mercury**, slow ion-rays of, A., 1073.  
atomic potential and charge distribution of, A., 1187.  
electrical resistance and critical point of, A., 1193.  
particles, evaporation of, A., 981.  
solid, Hall effect in, A., 452.  
vapour, diffraction of electrons in, A., 1073.  
scattering of electrons in, A., 789, 893.  
adsorption of, by active carbon, A., 689.  
decomposition of nitrous oxide by, A., 1214.  
use of, for heat transfer, B., 627.  
diffusion of, on tin foil, A., 906.  
solubilities of metals in, A., 457.  
solubility of gold in, A., 990.  
solubility of iron and nickel in, A., 330.  
crystals, structure of, A., 986.  
thermal data for, A., 905.  
as a dispersing medium, A., 993.  
thickness of adsorbed films on, A., 333.  
emulsions, A., 1086.  
toxicology of, B., 623.
- Mercury alloys (amalgams)**, A., 456, 1082.  
formation of, A., 1081.  
luminous effects produced by rolling of, on glass, A., 213.  
electrolytic conductivity of, A., 230.  
dental, testing of, B., 941.  
liquid, use of, in volumetric analysis, A., 1011.  
with cadmium, superconductivity of, A., 686.  
heats of solution, heats of formation, and free energies of formation of, A., 126.  
solid, A., 989.  
use of, in volumetric analysis, A., 712.  
with iron and with nickel, A., 456.  
with gold, A., 566.  
with manganese, A., 470.  
with sodium, production of, from sodium chloride, B., 430.  
liquid, A., 1196.  
viscosity of, A., 800.  
velocity of solution of, A., 1003.  
with tellurium, Hall effect in, A., 15.  
with thallium, free energies of formation and heats of formation of, A., 126.
- Mercury bases** :—
- Mercurammonium halides**, A., 919.
- Mercury salts**, manufacture of, (P.), B., 103.
- Mercury fulminate**, action of ultra-violet rays and heat on, A., 1214.  
halides, absorption and fluorescence spectra of, A., 896, 981.  
*d*ihalides, crystal structure of, A., 797.  
hydride, A., 127.  
spectrum of, A., 2, 104.  
solid, A., 1099.
- Mercuric ions**, detection of, A., 355.  
determination of, volumetrically, A., 355.
- Mercuric salts**, reduction of, by hypophosphorous acid, A., 355.  
titration of, with glass electrode, A., 1207.
- Mercuric bromide**, crystal structure of, A., 218.  
equilibrium of, with potassium bromide and water, A., 913.  
chloride, dark reaction between ammonium oxalate and, A., 235.  
action of, on zinc oxide, A., 822.  
compounds of, with ammonia and organic bases, A., 1217.  
determination of, volumetrically, A., 1103.

**Mercury:—**

- Mercuric chlorobromide**, A., 822.  
 oxide, action of, on zinc chloride, A., 822.  
 sulphide, solubility of, in hydrochloric acid, A., 1099.  
**Mercurous salts**, action of thiocyanates on, A., 583.  
**Mercurous chloride**, solubility of, A., 457.  
 action of ammonia and organic bases on, A., 1217.  
 electrodes. See under **Electrodes**.  
 nitrate, precipitation reactions of, A., 1103.  
 sulphate, hydrolysis of, A., 1089.  
**Mercury organic compounds**, manufacture of, (P.), B., 528.  
 therapeutic, (P.), B., 577, 913\*.  
 unsymmetrical, decomposition of, A., 409.  
**Mercury salts**, use of ethyl derivatives of, as soil and seed disinfectants, B., 782.  
**Mercury aralkyls and aryls**, A., 409.  
 aryls, reaction of, with lead organic salts and lead aryls, A., 1050.  
 benzyl and methyl iodides, formation of, A., 738.  
 benzyl chloromethyl, chloromethyl chloride, di(chloromethyl) and di(iodomethyl), A., 937.  
 dibenzyl, preparation of, A., 762.  
**Mercuriacetoxymercurimalonamamide**, hydroxy-, A., 938.  
**Mercuriacetoxymercurimalonamide**, hydroxy-, A., 938.  
**Mercuriacetoxymercurimalonamnaphtylamides**, hydroxy-, A., 938.  
**Mercuriacetoxymercurimalonamtolidides**, hydroxy-, A., 938.  
**Mercuriacetoxymercurimalonamxylidides**, hydroxy-, A., 938.  
**Mercuribenzoic acids**, cyano-, thiocyno-, and halogeno-, and their esters and derivatives, A., 70.  
 halogeno-, A., 866.  
**Mercuridibenzoic acids**, A., 70.  
**Mercuridiphenylmethane anhydride**, 4:4'-dihydroxy-3:3':5:5'-tetrahydroxy-, A., 410.  
**Mercuri-5-phenyl-5-ethylbarbituric acid**, 1-bromo-, and 1-hydroxy-, and its acetyl derivative, A., 66.  
**Mercuripyrindine**, 3-chloro-, A., 630.  
**Mercury detection and determination:—**  
 detection of, electrochemically, A., 490.  
 toxicologically, A., 1164.  
 detection and determination of, in small quantities, A., 923.  
 determination of, A., 1011.  
 in small quantities, A., 923.  
 colorimetrically, A., 490.  
 by Denigès' cyanide method, A., 35.  
 electrolytically, A., 590.  
 microchemically, as iodide, A., 1223.  
 micro-electrolytically, A., 922.  
 micrometrically, A., 590.  
 in air, A., 490.  
 in mixtures containing mercuric chloride and vegetable infusions, B., 1135.  
 in mercuric oxide and mercuric ammonium chloride, A., 355.  
 in oil preparations of its organic compounds, B., 623.  
 in organic compounds, in presence of halogens, arsenic, or sulphur, A., 955.  
 in impregnated wood, B., 1032.  
**Mercury cathodes**. See under **Cathodes**.  
**Mercury electrodes**. See under **Electrodes**.  
**Mercury ores**, treatment of, (P.), B., 847.  
**Mercury pumps**. See under **Pumps**.

- Meriandra**, cultivated, leaves of, A., 1179.  
**Mesaconic acid**, ethyl ester, reaction of, with sodium ethoxide, A., 1234.  
**Mescaline**, microchemical reactions of, A., 525.  
**Mesityl oxide**, and its homologues, manufacture of, (P.), B., 301.  
 hydrogenation of, (P.), B., 332.  
 condensation products of, A., 1236.  
 anil, A., 1142.  
**Mesitylacetamide**, A., 940.  
**Mesitylacetomesitylene**. See 2:4:6-Trimethylphenyl 2:4:6-trimethylbenzyl ketone.  
 $\gamma$ -**Mesitylbutyric acid**, and its nitrile, A., 1029.  
**Mesitylcarbonic acid**, ethyl ester, A., 1250.  
**2-Mesityl-8-dimethylquinoline-4-carboxylic acid**, 6:3-hydroxy-, A., 754.  
**Mesitylene**, separation of, from  $\psi$ -cymene, A., 607.  
**Mesitylenic ketones**, steric hindrance in, A., 1250.  
 $\beta$ -**Mesitylethyl alcohol**, and its derivatives, A., 940.  
 $\epsilon$ -**Mesityl-*n*-hexoic acid**, A., 1029.  
**Mesityl- $\beta$ -(2-naphthyl)thiocarbamide**,  $\alpha$ -chloro-, A., 154.  
 $\epsilon$ -**Mesitylpentan- $\alpha$ -ol**, and its derivatives, A., 1029.  
 $\gamma$ -**Mesitylpropionic acid**, ethyl ester, A., 941.  
 $\gamma$ -**Mesitylpropyl alcohol**, and its derivatives, A., 941.  
 $\gamma$ -**Mesitylpropyl bromide**, A., 1029.  
 $\gamma$ -**Mesitylpropylmalonic acid**, and its diethyl ester, A., 1029.  
**3-Mesityl-5-pyrazolone**, and its 4-benzylidene derivative, A., 1250.  
**Mesitylthiocarbimide**, chloro-, A., 154.  
 $\delta$ -**Mesityl-*n*-valeric acid**, and its amide, A., 1029.  
**Mesohydr**, A., 44.  
**Mesophylloporphyrin**. See 7-Methylmesoporphyrin.  
**Mesoporphyrin dimethyl ester**, A., 173.  
 silver salt, A., 626.  
 derivatives of, A., 757.  
**Mesothorium**, A., 707.  
 in natural waters of U.S.S.R., A., 1227.  
**Metabolism**, effect of low temperature on, A., 1058.  
 acid-base, of children on increasing fat diets, A., 1282.  
 amino-acids, A., 189, 876.  
 animal, on carbohydrate-free diet, A., 199, 885.  
 of cold-blooded animals, A., 420.  
 of fresh-water and marine animals, A., 1159.  
 bacterial, A., 653.  
 basal, A., 420.  
 of Australian aborigines, A., 1280.  
 of Australian merino sheep, A., 420.  
 bile acids, A., 85, 429, 639, 880.  
 bromine, A., 876.  
 calcium, effect of bile acids on, A., 300, 1283.  
 calcium, nitrogen, and phosphorus, effect of irradiated ergosterol on, A., 658.  
 calcium and phosphorus, A., 190, 423, 643.  
 in chickens, A., 539, 656, 773.  
 in dairy cows, A., 1161.  
 of infants, A., 646.  
 carbohydrate, A., 875.  
 nervous control of, A., 421.  
 effect of bile acids on, A., 188, 299, 639, 644, 771, 875, 1059, 1282.  
 influence of hepatic changes on, A., 961.

- Metabolism**, carbohydrate, effect of sulphur on, A., 1160.  
 after starvation, A., 1160.  
 in relation to thyroid, A., 299.  
 in birds, A., 644.  
 of mammary glands, A., 1059.  
 carbohydrate and fat, influence of spleen on, A., 1160.  
 fasting, of cattle, A., 420.  
 of the Chinese, A., 643.  
 cholesterol, A., 1160.  
 influence of spleen on, A., 423.  
 creatine, effect of disappearance of sex activity on, A., 1282.  
 creatine and creatinine, effect of diet of amino-acids and proteins on, A., 83.  
 cystine, A., 83, 646.  
 $\epsilon$ -cystine, in rats, A., 646.  
 embryonic, A., 419.  
 endogenous, of organic compounds, in fasting angiotomic dogs, A., 84.  
 fat, A., 85.  
 on diet devoid of fat, A., 1294.  
 of lactating goats, A., 1160.  
 galactose, non-fermentable residue in blood in, A., 1160.  
 gaseous, of growing tissues, A., 1058.  
 iron, during functional changes, A., 87.  
 action of copper on, A., 773, 1283.  
 relation of spleen and thyroid to, A., 1068.  
 microscopic detection of, A., 1162.  
 lactic acid, A., 191, 645.  
 lipin, effect of vitamin-B deficiency on, A., 547.  
 of fasting mealworms, effect of humidity on, A., 1159.  
 methionine, A., 83.  
 mineral, in man, A., 300, 642, 962.  
 in pregnancy and lactation, A., 1280.  
 nitrogen, in unbalanced nutrition, A., 434.  
 relation between oxygen consumption and, A., 186.  
 nuclein, A., 776, 1064, 1167.  
 in perfused organs, A., 539.  
 pectin, A., 1160.  
 pentose, A., 1282.  
 phospholipins, A., 538, 643.  
 effect of dietary deficiency on, A., 1282.  
 phosphorus, A., 1278.  
 influence of bile acids on, A., 293.  
 in embryos, A., 1283.  
 in infants, A., 963.  
 of growing pigs, A., 539.  
 protein, effect of temperature on, A., 299.  
 effect of thyroid therapy on, A., 1293.  
 effect of yeast on, A., 421.  
 in men and animals, A., 1059.  
 protein intermediary, A., 422.  
 in relation to carbohydrate economy, A., 1161.  
 purine, A., 84, 422.  
 influence of adrenaline on, A., 1161.  
 influence of glucose and insulin on, A., 1161.  
 influence of suprarenal cortex on, A., 1292.  
 rats', A., 643.  
 glass cage for measuring, 963.  
 sterols, A., 189.  
 sugar, A., 85.  
 of stimulated nerves, A., 770.  
 sulphur, A., 300, 646.  
 in dogs, A., 877.  
 of guinea-pigs on vitamin-C-free diet, A., 887.  
 in tissues, A., 770.  
 influence of halides on, A., 1281.

**Metabolism of normal and tumour tissues**, A., 644, 1160, 1278.  
 tricaprin, A., 423.  
 tryptophan, A., 299, 876, 1282.  
 tyrosine, A., 1159.  
 uracil, A., 84.  
**Metabolites, oxidation of**, A., 366.  
**Metacholesterol**, A., 736.  
**Metals, atomic moments of**, A., 217.  
 change of distance between atoms in, due to lattice changes, A., 113.  
 cellular theory of structure of, A., 15.  
 veining or sub-boundary structures of, B., 890.  
 allotropy of, A., 454.  
 electron structure and properties of, A., 452.  
 and their alloys, A., 455.  
 manufacture of, from metal powders, (P.), B., 350.  
 from their carbonyls, (P.), B., 349.  
 recovery of, from cold-working as shown by hardness, etc., B., 940.  
 from their ores, (P.), B., 848\*.  
 electrolytic refining of, (P.), B., 557.  
 at the Norddeutsche Affinerie in Hamburg, B., 554.  
 starting cathode for, (P.), B., 896.  
 tanks for, (P.), B., 1089.  
 removal of gases from, B., 644.  
 electrolytic removal of paint, etc., from, (P.), B., 731.  
 removal of paints, lacquers, etc., from, (P.), B., 637.  
 removal of scale, rust, etc., from, by hammering and rolling, (P.), B., 991.  
 bath for removal of vitreous coatings from, (P.), B., 684.  
 treatment of, with carbonaceous shale, (P.), B., 683.  
 annealing of, (P.), B., 608.  
 apparatus for, (P.), B., 608.  
 electric furnaces for, B., 232.  
 bright annealing of, (P.), B., 431.  
 with hydrocarbons, B., 347.  
 furnaces for annealing and carburising of, (P.), B., 730.  
 use of paraffin hydrocarbons in annealing and case-hardening of, (P.), B., 188.  
 casting of, (P.), B., 555.  
 moulds for, (P.), B., 112, 987.  
 in metal moulds, (P.), B., 28.  
 volume changes of, during casting, B., 430.  
 casting of compound blocks of, (P.), B., 645.  
 refining and casting of, in vacuo, (P.), B., 555.  
 core putty for sand-casting of, (P.), B., 896.  
 case-hardening of, (P.), B., 311.  
 discharge and heating of, in furnaces, (P.), B., 27.  
 furnaces for heating of, (P.), B., 847.  
 heat-treatment of, B., 108; (P.), B., 188.  
 electro-magnetic apparatus for, (P.), B., 27.  
 furnaces for, (P.), B., 730.  
 ovens for, (P.), B., 452.  
 heat-treatment and melting of, in electric furnaces, B., 511.  
 hot, viscous extension of, B., 349.  
 corrugated pot for melting of, (P.), B., 580.  
 furnaces for melting of, (P.), B., 349, 893.  
 use of coal in melting and heating of, B., 1122.  
 use of coke in melting and heating of, B., 1122.

**Metals, molten, treatment of**, (P.), B., 557.  
 refining of, (P.), B., 555.  
 internal friction of, A., 117.  
 prevention of oxidation of, when flowing from melting pots, (P.), B., 312.  
 furnaces for tempering of, (P.), B., 730.  
 calorising of, (P.), B., 111.  
 properties of, B., 1084.  
 at high temperatures, B., 1034.  
 measurement of mechanical properties of, B., 387.  
 apparatus for, (P.), B., 608.  
 influence of occluded gases on mechanical properties of, B., 65.  
 effect of cold working on modulus of rigidity of, B., 428.  
 resistance to abrasion in relation to hardness of, B., 681.  
 effect of bending on hardness of plates of, B., 1036.  
 cracking and fracture in rotary bending tests on, B., 1036.  
 effect of discontinuities and surface conditions on strength of, B., 985.  
 creep limit of, at high temperatures and effect of heat treatment thereon, B., 801.  
 accelerated test for limiting creep stress of, B., 347.  
 long-period temperature-stress tests on, B., 681.  
 clastic limit of, B., 554.  
 plastic distortion of, B., 230.  
 rate of loss of strength on deformation of, B., 309.  
 presses for, (P.), B., 610.  
 presses for extrusion of, (P.), B., 232.  
 effect of atmospheric conditions on fatigue of, B., 941.  
 effect of temperature on physical properties of, B., 185.  
 optical reflexion by, A., 787.  
 excited atoms and absorption spectra of vapours of, A., 319.  
 emission of light from vapours of, A., 104.  
 electronic theory of, A., 903.  
 scattering of X-rays by, A., 11.  
 electron emission from, by action of X-rays, A., 1184.  
 emission of secondary electrons from, A., 554.  
 electron diffraction by, A., 893.  
 interaction of lattice vibrations and free electrons in, A., 901.  
 surface potential of, for emission of electrons, A., 1073.  
 effect of molecular layers of gases on thermoelectric and photoelectric emission of, A., 119.  
 thermionic emission of, in iodine vapour, A., 1072.  
 anodic polarisation of, in aqueous solutions, A., 814.  
 overvoltage of, A., 24.  
 electrical conductivity of, at low temperatures, A., 983.  
 electrical resistance and superconductivity of, A., 683.  
 non-conducting modifications of, A., 1192.  
 current efficiency in electrolytic separation of, A., 478.  
 effect of torsion on density, dimensions, and electrical resistance of, B., 1036.  
 change of resistance of, with hydrostatic pressure, A., 676.  
 magnetic properties of thin films of, A., 904.  
 effect of cold-working on magnetism of, A., 904.

**Metals, diamagnetism of free electrons in**, A., 112.  
 dia- and para-magnetism in mixed crystals of, A., 907.  
 magnetic susceptibility of, A., 12.  
 stabilisation of, by magnetisation, B., 65.  
 thermal conductivity of, at high temperatures, A., 115.  
 and their nitrides, heats of solution of, in acids, A., 998.  
 boiling points of, A., 219.  
 liquid, conductivity of, in magnetic fields, A., 676.  
 solid, diffusion of, A., 1195.  
 flowability of, B., 430.  
 flow of solid aggregates of, B., 892.  
 adsorption and solution of gases by, A., 569.  
 capillary phenomena and wetting of, by electrolytes, A., 690.  
 surface activity of, A., 1211.  
 inter-diffusion of, A., 989.  
 solution of, in acids, A., 705.  
 in non-metallic solvents, A., 21.  
 segregations in solid solutions of, A., 220.  
 growth of crystals of, in metal vapour, A., 1191.  
 fatigue of crystals of, A., 563.  
 equilibria of, with slags in melts, A., 125, 811.  
 velocity of solution of, in bromine water, A., 1094.  
 effect of pressure on liberation of gases from, A., 1090.  
 dehydrogenation of mercaptans by, A., 431.  
 corrosion of, A., 1003; B., 644.  
 theory of, A., 27.  
 measurement of, in salt solutions, A., 593.  
 by milk, B., 320, 470, 525, 844.  
 effect of paints on, B., 117.  
 protective paints for prevention of, B., 728.  
 by potassium and other alkali salt solutions, B., 985.  
 by vegetable tanning liquors, B., 552, 801.  
 protection from, (P.), B., 351, 684.  
 passivity of, A., 25, 1093, 1208.  
 optical study of, A., 343.  
 anodic passivation of, A., 576.  
 corrosion-resisting coatings for, (P.), B., 1124.  
 coating of, (P.), B., 310.  
 by spraying, (P.), B., 557.  
 with insulating layers, (P.), B., 351.  
 with rubber, (P.), B., 359.  
 flexible vitreous coating for, (P.), B., 726.  
 determination of thickness of coatings on, (P.), B., 1039.  
 application of protective coating compositions to pickling baths for, (P.), B., 778.  
 pickling of, and cleaning, (P.), B., 990.  
 apparatus for, (P.), B., 191, 513.  
 inhibitors for, (P.), B., 188, 1037.  
 prevention of tarnishing of, (P.), B., 111.  
 resistant to alkali corrosion, B., 387.  
 enamels for, (P.), B., 771.  
 adherence of enamels to, B., 1030.  
 adherence of lubricants to, B., 27.  
 application of insulating varnishes to, (P.), B., 518.  
 electrodeposition of, (P.), B., 351, 473.  
 apparatus for, (P.), B., 991, 1037.  
 without external electric current, A., 481.  
 supersaturation in, A., 24.

**Metals**, electrodeposition of, on refractory surfaces, (P.), B., 189.  
 and their re-solution, A., 919.  
 in glacial acetic acid solution, A., 479.  
 from anhydrous ammonia, A., 129.  
 electrodes for fusion deposition of, (P.), B., 267.  
 electroplating with, (P.), B., 685.  
 coating with, of articles, (P.), B., 112.  
 of moulded articles, (P.), B., 272.  
 of materials, by cathodic disintegration, (P.), B., 389.  
 of resinous products, (P.), B., 948.  
 production of imitation matt-etching on, (P.), B., 991.  
 polishing of, A., 219, 328, 452.  
 sealing of, to glass, (P.), B., 27, 936.  
 soldering of, to porcelain, (P.), B., 990.  
 cementing of rubber to, (P.), B., 999.  
 preparation of, for painting, (P.), B., 803.  
 paste for moulds for, (P.), B., 1123.  
 treatment of carbonaceous residues from volatilisation of, (P.), B., 943.  
 prevention of oxidation of, in furnaces, (P.), B., 1122.  
 displacement of, by hydrogen under pressure, A., 238.  
 action of hydrogen on, A., 917.  
 application of ideal mass-action law to interaction of, B., 801.  
 ionic reactions of, in presence of organic acids, A., 355.  
 affinity of, for sulphur, A., 573.  
 activation of, by addition of other substances, A., 819.  
 oligodynamy of, A., 654, 1067.  
 bactericidal action of, A., 655.  
 erosion of, by gastric juice, A., 535.  
 analysis of gases in, A., 1010.  
 detection of, A., 354.  
 determination of, in organic compounds, A., 1223.  
 spectroscopically, in tissues, A., 416.  
**Metals**, acid-resistant, production of, (P.), B., 472.  
 alkali. See Alkali metals.  
 alkaline-earth. See Alkaline-earth metals.  
 annealed, pressure of fluidity of, B., 509.  
 anticathode, reactions between metallic sulphides and, A., 563.  
 used in aviation, X-ray spectroscopic analysis of, B., 729.  
 base, influence of metallic impurities on rate of solution of, A., 128.  
 bright, electrodeposition of, (P.), B., 896.  
 cast, type of fracture of, B., 430.  
 coated, welding of, (P.), B., 895.  
 cold-rolled, lattice-distortion in, A., 1193.  
 cold-worked, fibrous structure of, A., 681.  
 crystalline, growth of, A., 564.  
 polycrystalline, elastic and plastic deformation of, A., 669.  
 strain-hardening effect in, B., 347.  
 dia- and para-magnetic, effect of plastic deformation on susceptibility of, A., 1080.  
 electrolytic, examination of, with X-rays, B., 607.  
 structure of, A., 1192; B., 645.  
 tension in, B., 554.  
 ferromagnetic, magnetic transformation of, A., 565.  
 ferrous and non-ferrous, corrosion of, B., 508.  
 of Group IIb, detection of, A., 1223.  
 of Group V, precipitation of, from solutions of their chlorides by hydrogen under pressure, A., 31, 238.  
 of Group VIII, electrolytic production of, using a mercury cathode, (P.), B., 1124.

**Metals**, heavy, production of, electrolytically, from fused electrolytes, B., 430.  
 spectra of, A., 3.  
 of the iron group, magnetic ionic moment of, A., 563, 985.  
 paramagnetic anisotropy of salts of, A., 985.  
 light, dynamic mechanical properties of, B., 891.  
 hot strength of under static and dynamic stresses, B., 891.  
 stress-corrosion fracture of, B., 891.  
 excitation potentials of, A., 316.  
 effect of low temperatures on, B., 348.  
 electrodeposition of chromium on, B., 430.  
 magnetic, manufacture and refining of, (P.), B., 471.  
 heat-treatment of, (P.), B., 111.  
 magnetostrictive, change in resistance of, in magnetic fields, A., 1080.  
 noble, electrodeposition of, A., 472.  
 non-ferrous, limits of plastic flow in, B., 774.  
 separation of, from slags, etc., (P.), B., 389.  
 non-magnetic, ferromagnetic inclusions in, A., 1196.  
 oxidised, pickling of, (P.), B., 231.  
 polished, surface structure of, A., 681.  
 porous, manufacture of, (P.), B., 350.  
 powdered, apparatus for sintering of, (P.), B., 730.  
 properties of bodies from, B., 428.  
 precious, recovery of, from cyanide solutions, (P.), B., 181.  
 in electrolytic refining of copper, B., 846.  
 from ores, (P.), B., 311.  
 electrodeposition of, (P.), B., 896.  
 rare, determination and separation of, A., 356.  
 refractory, electrodes for electrodeposition of, (P.), B., 898.  
 coating of, with rhenium, (P.), B., 267.  
 superconducting, contacts of, A., 453.  
 volatile, purification of, by sublimation, (P.), B., 472.  
 worked, time law of recrystallisation of, B., 430.  
**Metal castings**, manufacture of, (P.), B., 110, 608.  
 hollow, thick-walled, production of, centrifugally, (P.), B., 731.  
**Metal foil**, production of, (P.), B., 351.  
 strengthened by gauze, (P.), B., 431.  
**Metal ingots**, casting of, (P.), B., 988.  
**Metal pipes**, coating of, with cement, etc., (P.), B., 191.  
 lining of, with corrosion-resistant coatings, (P.), B., 389.  
**Metal powders**, evaluation of, B., 942.  
 compressed, electrical conductivity of, A., 110.  
**Metal ribbon**, production of, from wire, (P.), B., 352.  
**Metal sheets**, apparatus for annealing of, (P.), B., 512.  
 furnaces for annealing of, (P.), B., 730.  
 reheating furnaces used in rolling of, (P.), B., 512.  
 enamels for, (P.), B., 64.  
 of two metals, (P.), B., 556.  
 production of composite sheets of cellulose derivatives and, (P.), B., 60.  
**Metal strips**, apparatus for cleaning of, (P.), B., 472.  
**Metal tubes**, manufacture of, (P.), B., 513.  
**Metal wires**, electric furnaces for heat-treatment of, (P.), B., 943.

**Metal wires**, elastic extension of, under longitudinal stress, B., 430.  
 coating of, (P.), B., 267.  
 incandescent, vacuum evaporation of, A., 565.  
 fine, piezo-electric determination of breaking strength of, B., 531.  
**Metallic articles**, containers for heat-treatment and carburisation of, (P.), B., 645.  
 coating of, (P.), B., 351.  
 protective coating of, (P.), B., 473.  
 removal of vitreous enamels from, (P.), B., 311.  
 prevention of erosion of, (P.), B., 111.  
 disinfecting and cleaning agents for, (P.), B., 322.  
 hollow, furnaces for heat-treatment of, (P.), B., 27.  
 sherardised, treatment of, (P.), B., 895.  
 detection of flaws in, (P.), B., 803.  
 azides, continuous precipitation of, (P.), B., 22.  
 carbonates and hydroxides, A., 585.  
 carbonyls, A., 134, 485, 920, 1219.  
 manufacture of, (P.), B., 599.  
 stable suspensions of, (P.), B., 465.  
 chlorides, anhydrous, preparation of, A., 482.  
 powdered, manufacture of, (P.), B., 22.  
 of heavy metals, equilibria of, with ammonium chloride, A., 469.  
 coatings, electrolytes for production of, (P.), B., 389.  
 couples, preparation of, A., 482.  
 cyanamides, A., 1098.  
 manufacture of, (P.), B., 261.  
 halides, reactions catalysed by, A., 49.  
 action of hydrocyanic acid on, A., 351.  
 halides, oxides, and sulphides, thermal dissociation of, A., 468.  
 hydrides, manufacture of, (P.), B., 465, 886.  
 hydroxides, gelation of sucrose with, A., 1202.  
 nitrates and nitrites, decomposition of, A., 823.  
 oxides, atomic dimensions and miscibility in the solid state of, A., 567.  
 active states of, A., 129.  
 dielectric constants of, A., 560.  
 selective adsorption of, and their auto-reduction in presence of glycogen, A., 1084.  
 structure of thin films of, A., 797.  
 manufacture of adsorbent gels from, (P.), B., 465.  
 photo-reduction of, A., 821.  
 refractory equilibria in ternary systems of, A., 997.  
 oxides and peroxides, thermal dissociation of, A., 468.  
 oxy-compounds, chlorination of, (P.), B., 261.  
 particles, small, regular arrangement of, A., 225.  
 salts, ultra-violet absorption spectra of ammoniacal solutions of, A., 444.  
 electrical conductance of aqueous solutions of, A., 214.  
 dissociation of, in water, A., 912.  
 fused, thermodynamics of solutions of, A., 999.  
 of low m.p., A., 685.  
 adsorption of, by caseinogen, A., 17.  
 changes of, in solution, A., 912.  
 in organic solvents, photochemical fission of, A., 1097.  
 tervalent, transformation of, in solution, A., 827, 996.

- Metallic state**, A., 217.  
 sulphides, interaction between anti-cathode metals and, A., 563.  
 oxidation of, (P.), B., 341.  
 surfaces, protection of, (P.), B., 683, 895.  
 prevention of corrosion of, (P.), B., 68.  
 treatment of, before coating, (P.), B., 513.  
 utensils, solution for sterilisation of, (P.), B., 914.
- Metallography** with polarised light, B., 27.
- Metallurgical specimens**, electrochemical reproduction of macro-structure of, B., 986.
- Metallurgy**, X-ray analysis in, B., 349.  
 X-ray interference in, B., 802.  
 unburned magnesite brick for use in, B., 307.  
 use of refractories in, B., 229.  
 use of silicon carbide in, B., 229.
- Metastability** of elements and compounds as result of enantiotropy or monotropy, A., 1089.
- Meteoric iron**, Grootfontein, S. Africa, A., 716.
- Meteoric stone** from Suwahib, Arabia, A., 359.
- Meteorites**, composition of, A., 1107.  
 from Black Hills, Wyoming, A., 926.  
 Brazilian, germanium in, A., 830.  
 Hoba, A., 359.  
 Hinojo, A., 597.  
 from Nebraska, A., 1230.
- Methaemoglobin**, production of, A., 73.
- Methane**, molecular oscillations of, A., 675.  
 formation of, by electrolysis of potassium acetate, A., 580.  
 pure, preparation of, and its determination in a mixture of hydrocarbons, A., 495.  
 production of, from carbon monoxide, (P.), B., 299.  
 from carbon dioxide, (P.), B., 886.  
 production of mixtures of hydrogen and, free from carbon monoxide, (P.), B., 136.  
 and its chloro-derivatives, refractivities and optical dispersions of, A., 9.  
 absorption spectrum of, A., 673.  
 near infra-red absorption spectrum of, A., 212.  
 and its halogen derivatives, spectra of, A., 675.  
 gaseous and liquid, Raman effect in, A., 320.  
 optical anisotropy of, A., 1075.  
 $M/N$  ratio for, A., 479.  
 specific heat and dissociation of, A., 1189.  
 heat capacity, entropy, and equilibrium constants of, A., 1203.  
 heats of combustion and formation of, A., 1091.  
 free energy of, A., 1089.  
 slow combustion of, A., 232.  
 formation of methyl alcohol and formaldehyde in, A., 232.  
 movement of flame in mixtures of, with air, A., 1001.  
 flame temperatures of mixtures of air, oxygen, hydrogen, acetylene and, A., 127.  
 chlorination of, A., 249.  
 conversion of, B., 919.  
 into carbon monoxide and hydrogen, B., 326.  
 into liquid hydrocarbons, (P.), B., 249, 377.  
 thermal decomposition of, A., 474, 1209.  
 decomposition by heating of mixtures of water vapour and, (P.), B., 55.
- Methane**, oxidation of, A., 476.  
 pyrolysis of, B., 1064.  
 derivatives containing chlorine and fluorine, manufacture of, (P.), B., 762.  
 homologues of, A., 927.  
 formation of acetic acid in biological production of, A., 428.  
 determination of, by combustion, B., 825.  
 apparatus for, (P.), B., 5.  
 in coal gas, etc., B., 53.  
 in mixtures with ethane, propane, and hydrogen, A., 241.  
 See also Firedamp.
- Methane**, tribromonitroso-, A., 257.  
 dichloro-, as a refrigerant, B., 659.  
 dichlorobromo-, Raman spectrum of, A., 7.  
 dichlorodibromo-, and chlorodibromo- and dichlorobromo-nitroso-, A., 605.  
 chlorodifluoro-, A., 830.  
 dichlorodifluoro-, as a refrigerant, A., 115; B., 659.  
 decomposition of, by flames, B., 715.  
 dichloro-mono- and -di-fluoro-, Raman spectra of, A., 897.  
 chlorotrifluoro-, A., 142.  
 halogen derivatives, near infra-red absorption spectra of, A., 445.  
 dinitro-derivatives, oxidising properties of, A., 1232.  
 tetranitro-, constitution of, A., 718.
- Methanedisulphonic acid**, thiol-, potassium mercury salt, A., 1233.
- Methanesulphonic acid**, iodo-, salts, manufacture of, (P.), B., 670.  
 sodium salt, industrial synthesis of, A., 929.
- Methanesulphonyl fluoride**, and its piperidine, A., 365.
- 2-(4'-Methanesulphonylphenoxy)naphthalene-1-sulphinic acid**, derivatives of, A., 735.
- 2-(4'-Methanesulphonylphenoxy)-1-naphthylthiol**, A., 735.
- 4-Methanesulphonylphenyl 2-hydroxy-1-naphthyl sulphide and  $\beta$ -naphthyl ether**, A., 735.
- 4'-Methanesulphonylphenyl-2-hydroxy-1-naphthylsulphone**, and its methyl ether, A., 735.
- Methanetrissulphonic acid**, thiol-, A., 1233.
- Methanetrissulphonic acids**, chloro-, and their salts and derivatives, A., 497.
- $\Delta^2$ -Methene**, manufacture of, (P.), B., 592.
- Methionine**, amino-, salts and acyl derivatives of, A., 1118.  
 thiol-, and its salts, A., 1018.
- Methionine**, isolation of, from keratin of ox-horn, A., 762.  
 preparation of, by enzymic hydrolysis, A., 304.  
 from caseinogen, A., 1148.  
 feeding experiments with, A., 876.  
 metabolism of. See under Metabolism.  
 determination of, in proteins, A., 1119.
- Methoxide**, sodium, reaction between sodium bromoacetate and, A., 127.
- Methoxyacetic acid**, esters and chloride of, A., 1019.
- $\gamma$ -Methoxyacetone**,  $\alpha$ -hydroxy-, A., 367.
- $p$ -Methoxyacetophenone**,  $\omega$ -amino-, and its derivatives, A., 54, 391.
- 2-Methoxy-7-acetyl-1:9-dimethylpurine**, 6:8-dihydroxy-, A., 1044.
- 7-Methoxy-3-acetyl-2-methyl-1:4-benzopyrones**, bromo-, A., 1256.
- 1-Methoxy-3-acetyl-4:5-isopropylidenequinic acid**, derivatives of, A., 850.
- 4-Methoxy-3-isomethylbenzoic acid**, 2-hydroxy-, A., 739.
- 2-Methoxy-9-anisylantracene**, A., 617.
- 2-Methoxy-9-anisyl-10-anthrone**, 9-hydroxy-, A., 617.
- 5'-Methoxy-9-anisyl-2-methyl-9:10-dihydrocoeranthra-10:7-dione**, A., 275.
- $\alpha$ -Methoxyanthraquinones**, basic character of, A., 947.
- 8-Methoxy-10-anthrone**, 1-hydroxy-, A., 164.
- 10-Methoxyanthrone**, 1:4-dichloro-, A., 1135.
- 10-Methoxyanthrones**, action of Grignard solutions on, A., 164.
- 3-Methoxybenzaldehyde  $p$ -nitrophenylhydrazones**, A., 384.
- 3-Methoxybenzaldehyde**, 4:5-dihydroxy-,  $p$ -nitrophenylhydrazone, A., 382.
- 4-Methoxybenzaldehyde**, bromonitrohydroxy- and nitrohydroxy-derivatives, A., 380.  
 3-fluoro-, A., 1247.
- $m$ -Methoxybenzamide**, A., 384.
- 4-Methoxy- $\alpha$ -benzamidoacinnamic acid**, 3-fluoro-, A., 1247.
- Methoxy-2:3-benzcarbazole-1:4-quinones**, A., 265.
- $o$ -Methoxybenzeneazo- $\beta$ -naphthol-6-sulphonic acid**, derivatives of, A., 264.
- 5-Methoxybenzofuran-4-propionic acid**, 3-hydroxy-, A., 860.
- $o$ -Methoxybenzhydramine hydrochloride**, A., 52.
- 2-Methoxybenzoic acid**,  $p$ -phenylphenacyl ester, A., 745.
- 2-Methoxybenzoic acid**, 6-amino-, A., 860.  
 5-hydroxy-, synthesis of, and its derivatives, A., 269.
- 3-Methoxybenzoic acid**, 4:5-dihydroxy-, methyl ester, A., 382.
- Methoxybenzoic acids**, conjugation of, in the body, A., 1061.
- 2-Methoxybenzoic anhydride**, A., 1129.
- 2-Methoxybenzophenone**, and its oximes, A., 52.
- 3-Methoxybenzophenone**, A., 390.
- 3-Methoxybenzophenone**, 4:5-dihydroxy-, and its oxime, A., 380.
- Methoxy- $p$ -benzoquinones**, valencies of, A., 853.
- 4'-Methoxybenzoyloxybenzaldehydes**, A., 1031.
- 4'-Methoxybenzoyloxybenzoic acids**, A., 1031.
- $\beta$ - $m$ -Methoxybenzoylpropionic acid**, A., 1122.
- $\alpha$ -Methoxybenzyl bromide**, A., 1132.  
 chloride, thermal decomposition of, and its derivatives, A., 383, 1132.
- 2-Methoxybenzyl chloride**, 5-bromo-, preparation of, A., 943.
- 3-Methoxybenzylamine**, and its derivatives, A., 384.
- 2- $p$ -Methoxybenzylaminopyridine**, A., 167.
- 10-Methoxy-9-benzyl-9:10-dihydroanthranol**, A., 164.
- Methoxybenzylidihydrozobrucidine**, and its methiodide, A., 528.
- 4'-Methoxybenzyl-3:4-dihydroisouquinoline**, 6-hydroxy-1:3'-hydroxy-, picrate, A., 1040.
- Methoxybenzylidihydrozostrychnidine**, and its derivatives, A., 406.
- $o$ -Methoxybenzylidimethylamine**, and its hydrochloride, A., 262.
- $p$ -Methoxybenzyl ethyl ketone**, and its semicarbazone, A., 392.
- 4-(4'-Methoxybenzylideneamino)acetophenone**, 4:2'-hydroxy-, A., 750.
- 4-(4'-Methoxybenzylideneamino)- $\omega$ -acetoxyacetophenone**, 4:2'-hydroxy-, A., 750.

- Methoxybenzylidenebisdi-indones, and hydroxy-, and their anhydro-derivatives, A., 1252.
- o*-Methoxybenzylidenecyanoacetic acid, ethyl ester, A., 1247.
- m*-Methoxybenzylidenediketohydrindene, A., 1252.
- Methoxybenzylidenediketohydrindenedi-indones, A., 1252.
- Methoxybenzylidenehippuric acid, 2-nitro-4-hydroxy-, and its acetyl derivative, ethyl ester, A., 69.
- m*-Methoxybenzylidenebenzylamine, A., 384.
- 4'-Methoxybenzyl-*N*-methyl-1:2:3:4-tetrahydroisoquinoline, 6-hydroxy-1:3'-hydroxy-, picrate, A., 1040.
- p*-Methoxybenzyl  $\alpha$ -propyl ketone, and its semicarbazone, A., 392.
- p*-Methoxybenzylpyridinium bromide, A., 1242.
- Methoxybenzyltetrahydrobrucidine, A., 528.
- 4'-Methoxybenzyl-1:2:3:4-tetrahydroisoquinoline, and its derivatives, A., 1040.
- Methoxybenzyltetrahydrostrychnidine, A., 406.
- 6'-Methoxybisthionaphthenindigo, 4:6-dichloro-, manufacture of stable water-soluble dye from, (P.), B., 58.
- 2-Methoxy-1-tribromoacetylnaphthalene, A., 164.
- $\alpha$ -Methoxy- $\beta\beta\beta$ -tribromoethylcarbamide, A., 1114.
- s*-( $\alpha$ -Methoxy- $\beta\beta\beta$ -tribromoethyl) ( $\alpha$ -ethoxy- $\beta\beta\beta$ -trichloroethyl)carbamide, A., 1114.
- s*-( $\alpha$ -Methoxy- $\beta\beta\beta$ -tribromoethyl) ( $\alpha$ -hydroxy- $\beta\beta\beta$ -trichloroethyl)carbamide, A., 1114.
- 3-Methoxy-2-(5-bromo-2-hydroxy-4-methylphenyl)phthalide, A., 164.
- 3-Methoxy-2-(5-bromo-2-hydroxyphenyl)phthalide, A., 164.
- p*-Methoxy- $\alpha$ -*o*-bromophenylcinnamic acid, A., 1047.
- $\beta$ -Methoxy-4 $\alpha$ -butene- $\alpha\delta$ -dicarboxylic acid, A., 1247.
- $\alpha$ -Methoxy-*n*-butyl chloride, A., 1132.
- 3'-Methoxycamphoranilic acid, A., 1253.
- 1-Methoxycarbostyryl, 3-hydroxy-, A., 384.
- 2-Methoxy-1-trichloroacetylnaphthalene, A., 164.
- 4'-Methoxychromone, A., 520.
- Methoxycinnamanilides, A., 386.
- 2-Methoxycinnamic acids, *p*-bromophenacyl esters, A., 1250.
- 4-Methoxycinnamic acid,  $\gamma$ -diethylamino-propyl ester, hydrochloride, A., 846.
- 4-Methoxycinnamic acid,  $\alpha$ -amino-3-fluoro-, benzoyl derivative, A., 1130.
- 3-Methoxycinnamionitrile, 4-hydroxy-, A., 843.
- $\alpha$ -Methoxycinnamyl chloride and mercurichloride, A., 333.
- 5-Methoxycoumarin, A., 751.
- Methoxydehydroergostatriene, A., 267.
- 2-Methoxy-9:9-dianisyl-9:10-dihydroanthracene, 10-anthrone derivative, A., 617.
- 3-Methoxy-4:5-di(carbomethoxy)benzoic acid, and its chloride, A., 382.
- 3'-Methoxy-3:5-di- $\beta$ -glucosidoxyflavylium chloride, 7:4'-dihydroxy-, A., 1141.
- 9-Methoxy-9:10-dihydroanthraquinyl-9:10-endo- $\alpha\beta$ -succinic anhydride, 1-chloro-, A., 745.
- 2-Methoxy-3:1'4'-dimethoxyanilino-*p*-benzoquinone, A., 1245.
- 5-Methoxy-1:3-dimethyl-3- $\beta$ -aminoethylindoline, and its salts, A., 759.
- 5-Methoxy-1:3-dimethyl-3- $\beta$ -aminoethyl-2-indolinone, salts of, A., 759.
- 10-Methoxy-1:4-dimethylanthrone, 5:8-dichloro-, A., 1135.
- 4-Methoxy-2:2-dimethyl-1:3-benzometoxazine, A., 865.
- 7-Methoxy-2:8-dimethyl-1:4-benzopyrone, A., 852.
- $\gamma$ -Methoxy- $\alpha\alpha$ -dimethylbutyronitrile, A., 727.
- 2-Methoxy- $\beta$ -4-dimethylcinnamic acid, A., 858.
- 2-Methoxy- $\beta$ -5-dimethylcinnamic acid, A., 620.
- 4-Methoxy-2:2-dimethyl-2:5-dihydrooxazole, A., 865.
- 5-Methoxy-1:3-dimethyl-3- $\beta$ -dimethylamino-2-indolinones, and their salts, A., 289.
- 2-Methoxy- $\beta$ -4-dimethyl- $\alpha$ -ethylcinnamic acid, A., 858.
- 2-Methoxy- $\beta$ -5-dimethyl- $\alpha$ -ethylcinnamic acid, A., 620.
- 9-Methoxy-1:7-dimethylphenanthrene, A., 948.
- 5-Methoxy-1:3-dimethyl-3- $\beta$ -phenoxyethyl-2-methyleneindoline, A., 289.
- 5-Methoxy-1:3-dimethyl-3- $\beta$ -phthalimidoethyl-2-indolinone, A., 759.
- 2-Methoxy-1:9-dimethylpurine, 6:8-dihydroxy-, A., 1044.
- 5-Methoxy-1:6-dimethyl-4-pyridone, 5-hydroxy-, A., 64.
- 4-Methoxy-1:3-dimethyluracil, A., 404.
- 4-Methoxydiphenyl ether, 3-amino-, and its diazonium fluoroborate, A., 1247.
- 3-amino- and 3-nitro-, A., 1130.
- 4'-bromo- and 4'-chloro-*di*iodo- and 2':4':6'-*tri*iodo-, A., 842.
- 4'-Methoxydiphenyl ether, 3-fluoro-, A., 1247.
- 6-Methoxy-2:3-diphenylindone, A., 848.
- $\alpha'$ -Methoxy- $\alpha\beta$ -diphenyloxan, A., 63.
- 2-Methoxydiphenylthiocarbamides, *mono*- and *di*-bromo-, A., 378.
- Methoxy- $\alpha$ -ergostadiene, A., 267.
- Methoxyergostatrienes, A., 267.
- Methoxyergostenes, A., 267.
- Methoxyethoxyacetophenone, and its derivatives, A., 177.
- Methoxyethoxyanilides, A., 1034.
- Methoxyethoxybenzaldoximes, A., 1034.
- Methoxyethoxybenzils, 2-chloro-, A., 1034.
- 4-Methoxy-3-ethoxybenzonitrile, A., 1034.
- Methoxyethoxybenzoyl- $\alpha$ -chlorophenylcarbinols, and their oximes, A., 1034.
- 10-Methoxy-9-ethoxy-2:3-methylenedioxy-7:8-dihydroprotuberberine, A., 177.
- Methoxy-2-ethoxymethyltriphenylcarbinols, A., 613.
- Methoxyethoxyphenyl  $\alpha$ -chlorobenzyl ketones, and their *anti*-oximes, A., 1034.
- $\alpha\beta$ -Methoxyethoxypropionic acid, A., 833.
- 3-Methoxy-2-ethoxytoluene, A., 177.
- Methoxyethoxytoluic acid, A., 177.
- Methoxyethyl arsenite, A., 937.
- 4-Methoxyethylcarbamide,  $\beta\beta\beta$ -trichloro-, and its *N*-acetyl derivative, A., 151.
- 3-Methoxy-4-ethylcarbonatophenylacetic acid, 2-nitro-, A., 56.
- N*-( $\alpha$ -Methoxyethyl)-*N'*-( $\beta\beta\beta$ -trichloro- $\alpha$ -hydroxyethyl)carbamide,  $\beta\beta\beta$ -trichloro-, and its *N'*- $\alpha$ -acetoxy-derivative, A., 151.
- Methoxyethyldihydroneostrychnidine, and its methiodide, A., 406.
- m*-Methoxy-*N*-ethyldiphenylbenzamidine, A., 386.
- Methoxyethyltetrahydrostrychnidine, A., 406.
- Methoxyflavylium perchlorates, amino- and aminohydroxy-, A., 750.
- salts, trihydroxy-, A., 859.
- $\gamma$ -Methoxyhexane, 8-bromo-, A., 361.
- 3-Methoxy-2-*o*-hydroxybenzylbenzoic acid, A., 164.
- 3-Methoxy-2-(2'-hydroxy-4'-methylbenzyl)benzoic acid, A., 164.
- 5-Methoxy-2-hydroxymethyl-4-pyridone, A., 63.
- 5-Methoxy-2-hydroxymethyl- $\gamma$ -pyrone, A., 63.
- Methoxyl groups, determination of, A., 291, 500, 867, 954.
- in plant materials, B., 618.
- in wood and pulp, B., 594.
- 5-Methoxy-2-methoxymethyl- $\gamma$ -pyrone, A., 63.
- 2-Methoxy-4-methylacetophenone semicarbazone, A., 858.
- 2-Methoxy-5-methylacetophenone semicarbazone, A., 620.
- 2-Methoxy-3-methylantraquinone, 4-chloro-, A., 617.
- 8-Methoxy-3-methyl-10-anthrone, 1-hydroxy-, A., 164.
- p*-Methoxymethylbenzaldehyde, and its dimethylacetal, A., 161.
- and its semicarbazone, A., 57.
- p*-Methoxymethylbenzoic acid, A., 57.
- 4-Methoxy-3-methylbenzophenone, 2-hydroxy-, A., 852.
- 4-Methoxy-3-methylbenzoylacetone, 2-hydroxy-, A., 852.
- 4'-Methoxy-3'-methylbenzoylbenzoic acid, *o*-2'-chloro-, A., 617.
- Methoxymethyldihydroneobrucine, A., 528.
- Methoxymethyldihydroneostrychnidine, derivatives of, A., 407.
- Methoxymethyldihydroneostrychnine, A., 527.
- 2-Methoxy-5-methyldiphenyl, A., 843.
- m*-Methoxy-*N*-methyldiphenylbenzamidines, A., 386.
- 1-Methoxy-2:3-methylenedioxybenzene, A., 611.
- Methoxy-6:7-methylenedioxy-1-benzyl-3:4-dihydroisoquinolines, 2'-nitro-, and their methiodides, A., 526.
- Methoxy-6:7-methylenedioxy-1-benzyl-2-methyltetrahydroisoquinolines, 2'-amino-, and their dihydrochlorides, A., 526.
- 4-Methoxy-3-methylfuran-2-carboxylic acid, ethyl ester, and its derivatives, A., 518.
- 5-Methoxy-1-methyl-2-hydroxymethyl-4-pyridone, A., 64.
- 5-Methoxy-1-methyl-2-methoxymethyl-4-pyridone, A., 64.
- $\gamma$ -(4-Methoxy-6-methylnaphthoyl)propionic acid, A., 948.
- $\gamma$ -(1-Methoxy-7-methyl-4-naphthyl)butyric acid, and its methyl ester, A., 948.
- $\alpha'$ -Methoxy-3-methylcyclopentane-1:1-diacetic acid,  $\alpha$ -hydroxy-, and its lactone, A., 740.
- 5-Methoxy-2-methyl-3- $\beta$ -phenoxyethylindole, A., 288.
- 4-Methoxy-3-methylphenylacetic acid, A., 513.
- 2-Methoxy-6-methylpropionophenone, and its semicarbazone, A., 858.
- 4-Methoxy-2-methyl-5-isopropylacetophenone, and its derivatives, A., 388.
- 4-Methoxy-2-methyl-5-isopropylchalcone, and its derivatives, and hydroxy-, A., 388.
- 6-Methoxy-4-methylquinoline, 2-hydroxy-, and its picrate, A., 402.
- 8-Methoxy-2-methylquinoline, 4-chloro-, and its salts, A., 951.
- $\beta$ -6-Methoxy-2-methyl-8-quinolylamino- $\alpha$ -dimethylaminopropane dihydrochloride, A., 1040.



- 6-Methoxy-4-methylquinolylmethylbenzamide, 2-hydroxy-, A., 1262.  
 4'-Methoxy-1:4- $\alpha$ -naphthapyrone, A., 520.  
 o-2-Methoxy- $\alpha$ -naphthoylbenzoic acid, A., 842.  
 $\beta$ -(4-Methoxynaphthoyl)propionic acid, A., 948.  
 2-Methoxy-2':4'-dinitrodiphenylamines, *mono*- and *di*-bromo-, A., 378.  
 5-Methoxy-3- $\beta$ -phenoxyethylindole, A., 288.  
 5-Methoxy-3- $\beta$ -phenoxyethylindole-2-carboxylic acid, and its ethyl ester, A., 289.  
 3-4'-Methoxyphenoxylfluorobenzene, and its azlactone derivative, A., 1130.  
 o-Methoxyphenyl o-phenylene phosphate and phosphite, A., 379.  
 3'-Methoxy-2-phenylacenaphthiminazole, 4'-hydroxy- and 3-nitro-4'-hydroxy-, A., 286.  
 3-Methoxyphenylacetic acid, 2-nitro-4-hydroxy-, A., 56.  
 6-nitro-4-hydroxy-, A., 69.  
 Methoxyphenylacetohomopiperonylamides, 2'-nitro-, A., 526.  
 l-p-Methoxyphenylalanine, and its salts and derivatives, A., 612.  
 6-Methoxy-2-phenyl-3-p-anisylindone, A., 848.  
 10-Methoxy-10-phenylanthrone, 1:8-dichloro-, A., 395.  
 4-Methoxy-4'-phenylbenzophenone, A., 515.  
 m-Methoxyphenyl benzyl ketone, and its semicarbazone, A., 390.  
 Methoxyphenyldibromoarsines, A., 953.  
 3'-Methoxy-N-phenylcamphorimide, A., 1253.  
 4-Methoxy-5-phenyl-2:2-dimethyl-2:5-dihydro-oxazole, A., 865.  
 Methoxyphenyl-2:6-dimethyl-1:4-dihydropyridine-3:5-dicarboxylic acids, nitro-, ethyl esters, A., 744.  
 Methoxy- $\beta$ -phenylethylamines, A., 1126.  
 Methoxy- $\beta$ -phenylethylmethylamines, and their salts, A., 1126.  
 Methoxyphenyldiiodoarsines, A., 953.  
 1-Methoxy-3-phenyl-4-methylene-3:4-dihydrophthalazine, 2'-chloro-4'-nitro-, A., 284.  
 7-Methoxy-2-phenyl-3-methyl-4:3'-indolylvinylbenzopyrylium chloride, A., 282.  
 1-Methoxy-3-phenyl-2'-methyl-4-methylene-3:4-dihydrophthalazine, 4'-nitro-, A., 405.  
 o-Methoxyphenylmethylnitrolic acid, A., 272.  
 3-Methoxy-5-phenyl-1:2:4-oxadiazole, A., 757.  
 $\alpha$ -Methoxy- $\beta$ -phenyloxen, A., 63.  
 $\beta$ -o-Methoxyphenylpropionamide, A., 1126.  
 3-Methoxyphenylpropionic acid,  $\alpha$ -cyano- $\beta$ -4-hydroxy-, and  $\beta$ -4-hydroxy-, nitrile, A., 843.  
 3-Methoxyphenylpyruvic acid, 2-nitro-4-hydroxy-, A., 69.  
 Methoxyphenyl styryl ketones, oximation of, and their derivatives, A., 387.  
 $\beta$ -p-Methoxyphenylthiopropiondimethylamide, A., 843.  
 3-Methoxyphthalaldehydic acid, synthesis of, A., 164.  
 4-Methoxyphthalide, 6-nitro-3-hydroxy-, and its acetyl derivative, A., 759.  
 $\beta$ -Methoxypropane,  $\beta$ -chloro-, A., 1132.  
 1-Methoxycyclopropane, 1-hydroxy-, and its p-nitrobenzoate, A., 1249.  
 2-Methoxy-5-isopropenyltoluene, A., 513.  
 1-Methoxy-4:5-isopropylidenequinamide, A., 850.  
 1-Methoxy-4:5-isopropylidenequinhydr-azide, and its derivatives, A., 850.  
 2-Methoxy-5-isopropyltoluene, A., 513.  
 4-Methoxypyridine-2:6-dicarboxylic acid, di-iodo-. See *O*-Methylchelidamic acid, di-iodo-.  
 4-Methoxyquinazoline, 2-chloro-, reaction of, with aniline, A., 755.  
 3-Methoxyquinic acid, A., 850.  
 Methoxyquinolines, amino-, and nitro-, and their salts, A., 1261.  
 $\beta$ -6-Methoxy-8-quinolylamino- $\alpha$ -diethylaminopropane dihydrochloride, A., 1040.  
 $\beta$ -6-Methoxy-8-quinolylamino- $\alpha$ -dimethylaminopropane dihydrochloride, A., 1040.  
 Methoxyretenes, A., 165, 943.  
 Methoxyricinine, A., 526.  
 4'-Methoxy-2-styryl-3-methylchromone, 7-hydroxy-, and its acetyl derivative, A., 520.  
 3-Methoxystyryl methyl ketone, 6-bromo-, and 5-nitro-4-hydroxy-, A., 513.  
 2-p-Methoxystyryl-3-methyl-1:4- $\alpha$ -naphthapyrone, A., 520.  
 2-Methoxystyryl-1:4- $\alpha$ -naphthapyrones, A., 520.  
 5-p-Methoxystyryltoluene, 2:4-dinitro-, A., 57.  
 $\beta$ -Methoxysuccinic acid,  $\alpha$ -hydroxy-, and its complexes with copper, A., 931.  
 Methoxysylvanecarboxylic acid, from  $\delta$ -ketorhammonic acid, constitution of, A., 518.  
 Methoxy-1:2:3:4-tetrahydroquinolines, 5-amino-, and their salts, A., 1261.  
 2-Methoxy-2:3:5:5-tetraphenyl-2:5-dihydrofuran, A., 518.  
 6-Methoxy-2-dithiobenzoic acid, A., 860.  
 Methoxythioxanthones, *mono*- and *di*-hydroxy-, and their salts, A., 860.  
 6-Methoxy-m-tolnaldehyde, 2-hydroxy-, A., 852.  
 2-Methoxy-m-tolnidine diazonium fluoroborate, A., 1247.  
 $\beta$ -6-Methoxy-m-tolyl- $\beta\beta$ -di(carbethoxymethyl)propionic acid,  $\alpha$ -cyano-, ethyl ester, A., 513.  
 $\beta$ -6-Methoxy-m-tolylglutaconic acid, and its derivatives, A., 513.  
 $\beta$ -6-Methoxy-m-tolylglutaric acid, and its ethyl ester, A., 513.  
 1-(4'-Methoxy-m-tolyl)cyclohexanol, A., 843.  
 6-Methoxy-m-tolylmethanetriacetic acid, A., 513.  
 4-(6-Methoxy-m-tolyl)pyridine, 2:6-dihydroxy-, and its salts, and oximino-, A., 513.  
 2-Methoxy-9:9:10-trianisyl-9:10-dihydroanthracene, 10-hydroxy-, A., 617.  
 2-Methoxy- $\alpha\beta$ -4-trimethylcinnamic acid, A., 858.  
 10-Methoxy-1:4:9:9-trimethyl-9:10-dihydroanthranol, A., 164.  
 4-Methoxy-2:2:5-trimethyl-3:5-dihydro-oxazole, A., 865.  
 5-Methoxy-1:2:3-trimethyl-3- $\beta$ -phenoxyethylindoleninium salts, A., 289.  
 6-Methoxy-m-xylene, 5-bromo-4-fluoro-, A., 945.  
 6-Methoxy-m-4-xylylene, 5-bromo-, and its derivatives, A., 945.  
 Methyl alcohol, synthesis of, A., 347.  
 patents for, B., 414.  
 from carbon monoxide and hydrogen under pressure, B., 11.  
 complex catalysts for, B., 137.  
 by alkalis catalysts, B., 250.  
 production of, from carbon dioxide, (P.), B., 886.  
 from coke-oven gas or town gas, (P.), B., 329.  
 catalytic production of, A., 477.  
 reduction of catalyst for, B., 300.  
 Methyl alcohol, origin and removal of, from alcoholic liquors, B., 281.  
 distillation of, with benzene and water, A., 687.  
 rectification of, (P.), B., 94.  
 heat of combustion of, A., 341.  
 surface tension of, A., 1078.  
 solutions, kinetic salt effect in, A., 127.  
 equilibrium of, with acetone, A., 1197.  
 with isoamyl alcohol and water, A., 801.  
 with hydrogen chloride, methyl nitrite, and nitrosyl chloride, A., 808.  
 platinum metals as catalysts in decomposition of, A., 235.  
 degradation of, by acetic bacteria, A., 1289.  
 rate of esterification of, in acetic acid, A., 1002.  
 toxicity of, A., 964.  
 homologues of, A., 927.  
 manufacture of derivatives of, by fermentation, (P.), B., 525.  
 detection of, in presence of ethyl alcohol, A., 928; B., 378.  
 determination of, in presence of ethyl alcohol, A., 763.  
 effect of dimethyl ether on, A., 250.  
 determination in, of moisture, B., 94.  
 Methyl bromide, physical properties of, A., 329.  
 $\delta$ -dibromo-n- $\Delta^8$ -pentenyl ether, A., 362.  
 chloride, as a refrigerant, B., 659.  
 detection of, B., 51.  
 determination of, in air, B., 831.  
 N-diphenylurethane, and trichloro-, and N-p-nitrophenylurethane, trichloro-, A., 1239.  
 esters and iodides, X-ray data for, A., 326.  
 ether, structure of, A., 1078.  
 Raman spectrum of, A., 1076.  
 equilibrium of, with carbon dioxide and with propylene, A., 800.  
 decomposition of mixtures of, with acetone and ethyl ether, A., 1209.  
 fluoride, physical constants of, A., 980.  
 halides, ultra-violet absorption spectra of, A., 896.  
 iodide, Raman spectrum of, A., 1189.  
 nitrite, equilibrium of, with hydrogen chloride, methyl alcohol, and nitrosyl chloride, A., 808.  
 o-phenylene phosphite, A., 379.  
 selenate, explosibility of, A., 484.  
 $\zeta$ -(1:1:3-trimethyl-2-cyclohexyl)- $\delta$ -methyl hexyl ether, A., 853.  
 2'-N-Methylacetamidodiphenyl, 2-amino-, A., 524.  
 Methylacetophenone, and 5-hydroxy-, and their derivatives, A., 62.  
 3-Methylacetophenone, 4-hydroxy-, A., 513.  
 4-Methylacetophenone,  $\omega$ -iodo-, A., 744.  
 1-Methyl-8-acetoxypheanthrene, A., 165.  
 2-Methyl-6-acetyl-lactamidoquinoline, and its salts, A., 623.  
 2-Methyl-3-allylquinoline, 4-hydroxy-, formation of, from 4-allyloxy-2-methylquinoline, A., 862.  
 Methylamine, occurrence of, in urine, A., 767.  
 physical properties of, A., 329.  
 heat of solution of, A., 698.  
 condensation of, with succindialdehyde and malonic acid, A., 741.  
 reaction of, with ethyl cinnamate, A., 1246.  
 with ethyl crotonate, A., 600.  
 as a refrigerant, B., 1011.

Methylamines, formation of, by catalytic dehydration of methyl alcohol and ammonia, A., 48.

5-Methylaminobarbituric acid, 5-bromo-, A., 283.

1-Methylaminobenzthiazole-5-carboxylic acid, and its derivatives, A., 1267.

$\beta$ -Methylaminobutyric acid, A., 600.

Methylaminocamphanodihydroquinoxaline, and its derivatives, A., 166.

3-Methylamino-2-carboxycyclopentane-1-acetic acid, and its derivatives, A., 741.

3-Methylamino-2,2-dicarboxycyclopentane-1-acetic acid, and its derivatives, A., 741.

4-Methylamino-3,9-dimethyl-4,5-dihydro-uric acid, 5-hydroxy-, and its picrate, A., 1045.

$\beta$ -Methylamino- $\alpha$ -dimethylpropaldehyde, and its derivatives, A., 504.

$\gamma$ -Methylamino- $\beta$ -dimethylpropyl alcohol, and its derivatives, A., 504.

Methylaminodiphenyl ether, and its salts, and nitroso-, A., 1242.

$\beta$ -Methylamino- $\alpha$ -*m*- and -*p*-hydroxyphenylethyl alcohols, preparation of, (P.), B., 48.

2-Methylamino-2'-methylethylaminodiphenyl, A., 524.

$\alpha$ -Methylamino- $\alpha$ -phenyl-*n*-propyl alcohols, manufacture of, (P.), B., 95.

$\beta$ -Methylamino- $\alpha$ -phenyl-*n*-propyl alcohols, optically active, manufacture of, (P.), B., 13.

$\beta$ -Methylaminopropionic acid, ethyl ester, deamination of, A., 1023.

4-Methylaminoveratrole, A., 402.

Methylammonium compounds, thio-, pharmacology of, A., 540.

8-Methyl- $\beta$ -amyl arsenite, A., 937.

Methylisoamylamine, derivatives of, A., 726.

5-Methyl- $\gamma$ -isoamylheptan- $\beta$ -one, A., 368.

*l*- $\beta$ -Methyl- $\gamma$ -amylhexane, A., 360.

Methyl-*n*-amyl-*n*-hexylamine, and its salts, A., 48.

Methyl  $\beta$ -amyl ketone, and its derivatives, A., 44.

Methyl-*n*-amyl-*n*-octylamine, A., 48.

Methylanabesine, and its picrate, A., 287.

*N*-Methylanabesine, and its derivatives, A., 758.

Methylaniline, complex salt of, with cuprous chloride, A., 376.

Methylaniline, 2-chloro-*mono*- and -*di*-nitro-, and their derivatives, A., 1025.

*N*-Methylanilinonaphthalimide, A., 862.

*N*-Methylanilinophthalimide, A., 862.

*N*-Methylanilinoquinolinimide, A., 862.

4-Methylanilinosulphonylphenyl  $\beta$ -naphthyl ether, A., 735.

Methyl-*p*-anisidine, nitroso-, A., 842.

Methylanisylglycollic acids, A., 1037.

2-Methylanthracene, 9:10-dichloro-, A., 944.

2-Methylanthracene-1-carboxylic acid, 9:10-dichloro-, and its chloride, A., 275.

2-Methylanthracene-10-carboxylic acid, 9-chloro-, A., 944.

Methylanthraquinone, 2-hydroxy- and 1:8-dihydroxy-3-hydroxy-, A., 1252.

1:8-dihydroxy-. See Chrysophanic acid.

2-Methylanthraquinones, dichloro-, manufacture of, (P.), B., 139.

3-Methylanthraquinone, 4-chloro-2-hydroxy-, A., 617.

dihydroxy-derivatives, synthesis of, A., 516.

Methylanthraquinone-1-carboxylic acid, 2-dichloro-, A., 274.

3-Methylanthrones, 1:8-dihydroxy-, and their acetates, A., 164.

*O*-Methylatropine, and its derivatives, A., 287.

Methylazobenzenes, 4-oximinoamino-, acetyl derivatives, A., 509.

*N*-Methylaztropinone, and its derivatives, A., 1148.

*O*-Methylbarbatic acid, methyl ester, A., 850.

*p*-Methylbenzaldehyde dimethylacetal, A., 1132.

*m*-Methylbenzaldehyde *p*-nitrophenylhydrazone, A., 384.

3-(4'-Methylbenzamido)carbazoledisulphonic acid, 3-3'-nitro-, and 3-3'-nitro-amino-, benzoyl derivative, and their sodium salts, A., 176.

4-Methyl-1:2-benzanthracene, and its picrate, A., 1136.

Methyl-1:2-benzanthracenes, and their derivatives, A., 374.

4-Methyl-1:2-benzanthraquinone, and its quinol diacetate, A., 1136.

4-Methyl-1:2-benz-9-anthrene, A., 1136.

Methylbenzimidazolearsonic acids, 2-hydroxy-, manufacture of, (P.), B., 128.

4-Methylbenzophenone, 2-hydroxy-, and its derivatives, A., 858.

5-Methylbenzophenone-3:2'-dicarboxylic acid, 4-hydroxy-, and its derivatives, A., 1031.

Methyl-*p*-benzoquinones, valencies of, A., 853.

4'-Methylbenzoyl-3-aminobenzoyl- $\beta$ -naphthylamine-4:6:8-trisulphonic acid, 3'-nitro-, trisodium salt, A., 840.

4'-Methylbenzoyl-3-amino-4-methylbenzoyl- $\beta$ -naphthylamine-4:6:8-trisulphonic acid, 3'-nitro-, trisodium salt, A., 840.

4'-Methylbenzoylbenzoic acids, amino-2:2'-hydroxy-, and their hydroxy-derivatives, and nitro-2:2'-hydroxy-, A., 516.

4-Methylbenzoyl- $\beta$ -naphthylamine-4:6:8-trisulphonic acid, 3-nitro-, trisodium salt, A., 840.

$\beta$ -*N*-Methyl-*N'*- $\gamma'$ -benzoyloxypropylpropionic acid, ethyl ester, A., 759.

2-Methylbenzpinacol, A., 515.

*m*-Methylbenzylamine, derivatives of, A., 384.

Methylbenzylamine, 2,4-dinitro-, A., 726.

2-(4'-Methylbenzyl)benzoic acid, 3-hydroxy-2:2'-hydroxy-, A., 164.

Methylbenzylidimethylamines, A., 262.

2-Methyl-1-benzylglyoxaline benzyl chloride, A., 371.

$\alpha$ -Methylbenzylideneglycerol, A., 514.

*m*-Methylbenzylidenebenzylamine, A., 384.

Methylbixin, A., 682.

4-Methyl-2-bromomethylpyrrole-3:5-dicarboxylic acid, ethyl ester, thiocyanomethyl derivative, A., 861.

Methyl-5-bromothiophen-2-arsinic acid, A., 630.

*N*-Methylbrucinonic acid, derivatives of, A., 407.

Methylneobrucinium salts, A., 528.

$\gamma$ -Methyl- $\Delta^4$ -butadiene,  $\beta$ -chloro-, A., 1232.

Methylbutadienes, A., 141.

$\beta$ -Methylbutane,  $\alpha\beta$ -diamino-, diacetyl derivative, A., 256.

Methylbutane- $\alpha\delta$ -diol,  $\beta$ -nitro- $\beta$ -hydroxy-, and its salts, A., 497.

$\beta$ -Methylbutanol. See *n*-Amyl alcohol.

$\beta$ -Methylbutan- $\gamma$ -one,  $\beta$ -hydroxylamino-, oxime, derivatives of, A., 750.

$\beta$ -Methyl- $\Delta^8$ -butene, Raman spectrum of, A., 1189.

$\gamma$ -Methyl- $\Delta^8$ -butene,  $\beta$ -bromo-, Raman spectrum of, A., 1189.

$\Delta^8$ -Methyl- $\Delta^4$ -butenoic acid, methyl ester, dibromide of, A., 1143.

Methylbutylamines, derivatives of, A., 726.

Methyl-*n*-butyl-*n*-amylamine, and its salts, A., 48.

Methylisobutylaniline, 2,4-dinitro-, A., 726.

*l*-Methylisobutylcarbinol, and its  $\alpha$ -naphthylurethane, A., 142.

2-Methyl-3-isobutylchromone, and 6-nitro-, A., 520.

*l*- $\beta$ -Methyl-*c*-*n*-butylhexane, A., 360.

$\beta$ -Methyl-8-butylactan- $\gamma$ -one, A., 831.

Methyl-*n*-butylpentenylamine, and its salts, A., 48.

2-Methyl-3-*n*-butylquinoline, and its picrate, A., 1046.

Methyl *tert*-.butylsulphone, A., 1017.

$\alpha$ -Methylbutyl-*p*-ethoxyphenylhydrazide, A., 1142.

$\alpha$ -Methylbutyl-*as*-*p*-ethoxyphenylmethylhydrazide, A., 1142.

4-Methylcamphor, oximino-, and its sodium salt, A., 277.

3-Methylcamphoric acid, and its derivatives, A., 277.

4-Methylcamphorquinone, A., 277.

7-Methylcarbamidofluorenone-2-arsinic acid, and its sodium salt, A., 761.

1-*N*-Methylcarbamyl-3-naphthoic acid, 2-hydroxy-, ethyl ester, A., 743.

*p*-Methylcarbonatobenzanilide, A., 386.

4-Methyl-3- $\beta$ -carboxyethyl-2- $\beta$ -cyano- $\beta$ -carbethoxyethylpyrrole-5-carboxylic acid, ethyl ester, A., 861.

4-Methyl-3- $\beta$ -carboxyethyl-2- $\beta$ -dicarbethoxyethylpyrrole-5-carboxylic acid, ethyl ester, A., 861.

4-Methyl-3- $\beta$ -carboxyethyl-2- $\beta$ -dicarbethoxyethylpyrrole-5-carboxylic acid, ethyl ester, A., 861.

4-Methyl-2- $\beta$ -carboxyethylpyrrole-3-carboxylic acid, derivatives of, A., 861.

Methylcellulose, action of heat on, A., 1117.

*O*-Methylchelidamic acid, 3:5-diiodo-, A., 622.

*N*-Methylchelidamic acid, 3:5-diiodo-, and its methyl ester, A., 622.

Methylchlorocamphoric anhydride, A., 277.

Methylchloroglyoxime, dicarbanyl derivative, A., 1146.

peroxide, A., 513.

Methylchloromethyltrichloromethylcarbinol, A., 383.

Methylchlorophyllide, allomerisation of, A., 757.

$\beta$ -Methylcholine picrate, A., 257.

Methylcholines, preparation of, A., 257.

$\alpha$ -Methylcitric acid, ethyl ester, A., 602.

Methylcodeine. See Dimethylmorphine.

2-Methylcoeranthrone-7', and its derivatives, and 10-hydroxy-, A., 274.

7-Methylcoumarin-6-arsinic acid, A., 761.

7-Methylcoumarin-6-azosulpho- $\alpha$ -naphthylarsinic acid, A., 1268.

4-Methylcoumarinylacetic acid, 7-hydroxy-, and its salts and derivatives, A., 519.

Methylcresols, *di*- and *tri*-hydroxy-, A., 610.

$\beta$ -Methylcrotonaldehyde, and its condensation and derivatives, A., 834.

4-Methyl-2- $\beta$ -cyano- $\beta$ -carbethoxyethylpyrrole-3:5-dicarboxylic acid, ethyl ester, A., 861.

5-Methyl-2-cyanomethylfuran. See 5-Methylfuryl-2-acetonitrile.

4-Methyl-3- $\beta$ -*di*-cyanovinylpyrrole-2:5-dicarboxylic acid, derivatives of, A., 626.

$\alpha$ -Methyl-*trans*-decahydronaphthylidene-2-acetone, semicarbazone of, A., 1033.

*l*-8-Methyldecoic acid, A., 365.

Methylderritol, A., 400.

3-Methyl-2:6-diallylcyclohexanone, A., 162.

Methyldi-*n*-amylarsine, and its salts, A., 1119.

- 8-Methyl-dibenzotetrahydropyrrocolinium hydrochloride, 2:3:11:12-tetrahydroxy-, A., 527.  
 salts, 2:3:11:12-tetrahydroxy-, A., 1047.  
 Methyl-dibenzylarsine, and its chloromercurate, A., 1119.  
 Methyl-dibutylarsines, and their salts, A., 1119.  
 4-Methyl-2- $\beta$ -dicarboxyethylpyrrole-3:5-dicarboxylic acid, ethyl ester, A., 861.  
 4-Methyl-2:3-di- $\beta$ -carboxyethylpyrrole-5-carboxylic acid, and its trimethyl ester, A., 282.  
 ethyl ester, A., 861.  
 4-Methyl-2- $\beta$ -dicarboxyethylpyrrole-3:5-dicarboxylic acid, ethyl ester, A., 861.  
 5-Methyl-3:4-di- $\beta$ -carboxyethylpyrromethene, 4:5:3'-tribromo-, and its hydrobromide, A., 281.  
 4(5)-Methyl-1:2-diethylglyoxaline, and its salts, A., 371.  
 1-Methyl-2:5-diethylpyrrole, A., 622.  
 Methyl-di-*n*-hexylarsine, and its chloromercurate, A., 1119.  
 Methyl-dicyclohexylarsine, and its salts, A., 1119.  
 2-Methyl-9:10-dihydrococranthra-10:7'-dione, A., 274.  
 Methyl-dihydroderittol, A., 400.  
 1-Methyl-dihydrohydrastinine picrate, A., 1262.  
 1-Methyl-dihydro- $\alpha$ -naphthoindazole, and its picrate, A., 863.  
 Methyl-dihydro- $\alpha$ -naphthoindazoles, A., 863.  
*N*-Methyl-3:4-dihydroisopapaverine, A., 1047.  
 9-Methyl-9:10-dihydrophenanthrene-10-carboxylic acid, A., 382.  
 10-Methyl-5:10-dihydrophenarsazine, 10-chloro-10-hydroxy-, and 5-nitroso-, A., 630.  
 10-chloro-7-nitro-, A., 181.  
 3-Methyl-4:5-dihydrouracil, A., 754.  
*N*-Methyl- $\beta$ -3:4-dimethoxyphenylethylamine, and its picrate, A., 843.  
 Methyl  $\beta$ -dimethyl-dodecyl ketone, and its semicarbazone, A., 832.  
 3-Methyl- $\alpha$ -dimethylphthalide, A., 382.  
 9-Methyl-dinor-dioxyseroline, A., 952.  
 Methyl-1:3-dioxalan, 2-hydroxy-2'-dichloro-, A., 1115.  
 2-Methyl-diphenimidine, and its salts, A., 524.  
 2'-Methyl-diphenyl, 2-amino-, 2-cyano-, 2-halogeno-, and 2-nitro-, A., 607.  
 3-Methyl-diphenyl, nitration of, and 4-amino-, acetyl derivative, and 4:4'-diniro-, A., 1024.  
 4-Methyl-diphenyl, nitration of, and amino-, acetyl and benzoyl derivatives, and dinitro-, A., 838.  
 4-Methyl-diphenyl, 3:5-dichloro-, and 3:5-dichloro-4'-nitro-, A., 735.  
 5-Methyl-diphenyl, 2-hydroxy-, A., 843.  
 Methyl-diphenyls, and *mono* and *di*-hydroxy-, and their derivatives, A., 1121.  
 Methyl-diphenyl sulphides, 4-hydroxy-, A., 844.  
 3-Methyl-diphenyl ether, 4-hydroxy-, A., 844.  
 4-Methyl-diphenylamine, 3:5-dichloro-4'-nitro-, and its acetyl derivative, A., 736.  
 4'-Methyl-diphenylamine, 2'-bromo-2:4:6-trinitro-, A., 1124.  
 Methyl-diphenylamines, 2'-4'-dinitro-2-amino-, and their *p*-toluenesulphonyl derivatives, A., 1124.  
 Methyl-diphenylamine-6'-arsinic acids, 3'-nitro-, A., 181.  
 4-Methyl-diphenylamine-2-carboxylic acid, 2-nitro-, and its ethyl ester, A., 734.  
 5-Methyl-diphenylamine-2-carboxylic acid, 4-nitro-, derivatives of, A., 734.  
*N*-Methyl-diphenylbenzamidines, *p*-bromo-, *o*-chloro- and nitro-, A., 386.  
 1-Methyl-diphenylene picrate and oxide, A., 1121.  
 Methyl-di- $\beta$ -phenylethylarsine, and its salts, A., 1119.  
 Methyl-diphenylmethane, chloro-*m*-dichloro-, A., 50.  
 Methyl-diphenylsulphonic acids, derivatives of, A., 1121.  
 Methyl-di-*n*-propylarsine, and its salts, A., 1119.  
 3-Methyl-6:6-dipropylcyclohexanone, and its benzylidene derivative, A., 162.  
 Methyl-di-*p*-tolylarsine, and its salts, A., 1119.  
 Methyl-ditolylmethane, dihydroxydihydroxy-, A., 610.  
 $\gamma$ -Methyl- $\Delta^{\alpha}$ -dodecadiene, A., 1110.  
 $\gamma$ -Methyl-dodecane- $\alpha$ -diol, and its derivatives, A., 1110.  
 $\gamma$ -Methyl- $\Delta^{\gamma}$ -dodecen- $\alpha$ -ol, and its derivatives, A., 1110.  
 $\delta$ -Methyl-*n*-dodecoic acid, A., 1233.  
 Methylene chloride, stability of, B., 300.  
 compounds, active, condensation of, with aldehydes, A., 514.  
 dibenzthiazyl sulphide, A., 1114.  
 groups, reactive, mercuration of compounds containing, A., 937.  
 oxidation of, A., 746.  
 interaction of thionyl chloride with substances containing, A., 840.  
 iodide, formation of, by oxidation of iodoacetic acid, A., 1109.  
 f.p. of two forms of, A., 328.  
 sulphate, constitution of, and its reaction with tertiary bases, A., 250.  
 Methyleneacetophenone, hydroxy-, acetate, A., 521.  
 Methyleneamines, cyclic, reduction products of, A., 726.  
 Methyleneaminobiuret, A., 1239.  
 Methylene-*p*-aminophenol, reduction of, and its structure, A., 378.  
 Methylene-diaminophenylene-4:4'-distibinous oxide, A., 867.  
 Methyleneaniline, polymerism and structure of, A., 1124.  
 Methyleneanthrone, manufacture of dyes from, (P.), B., 833.  
 Methylenebisdi-hydroxyangonolactone, and its acetyl derivative, A., 748.  
 Methylenebistetrahydrocarbazole, A., 53.  
 Methylenebistriacetic acid, diacetyl derivative, A., 748.  
 Methylenebisangonin, A., 748.  
 Methylenebisangonolactone, and its acetyl derivative, A., 748.  
 Methylene-blue, precipitation of, by electrolytes in gelatin, A., 693.  
 hydrogenation of, in system amino-compound-aldehyde-hydrogen, A., 1114.  
 reduction of, in milk, A., 533.  
 Methyleneamphors, amino- and imino-, stereoisomeric, A., 857.  
*d*-Methylenecamphor-*d*-alanine, ethyl ester, A., 194.  
 Methylene-cellulose, A., 1117.  
 2-Methylene-*trans*-decalin, and its nitropiperidides, A., 1032.  
 Methylene- $\beta\beta$ -diadipic acid, and its tetraethyl ester, A., 53.  
 Methylene-diguaiacol, manufacture of derivatives of, (P.), B., 80.  
 Methylene-diketopentamethylenecarboxylic acid, ethyl ester, A., 53.  
 3:4-Methylenedioxyacetophenone, and its salts and benzoyl derivative, A., 54.  
 3:4-Methylenedioxybenzoyl-*p*-chlorophenylcarbinol oxime, A., 1034.  
 2:3:4'-Methylenedioxybenzylaminopyridine, A., 167.  
 3:4-Methylenedioxy-cinnamitrile, A., 843.  
 6:7-Methylenedioxy-2-methylnaphthalene. See Podophyllomerol.  
 6- $\omega$ -Methylenedioxy-methylquinoline, and its picrate, A., 1262.  
 3:4-Methylenedioxyphenylacet-4'-dimethylaminoanilide, A., 1034.  
 anti-3:4'-Methylenedioxyphenyl-*p*-chlorobenzyl ketoxime, A., 1034.  
 6:7-Methylenedioxy-1-phenyl-3:4-dihydroisoquinoline-2'-carboxylic acid, A., 1262.  
 $\beta$ -3:4-Methylenedioxyphenylethylamine,  $\beta$ -hydroxy-, and its derivatives, A., 55.  
 $\gamma$ -3:4-Methylenedioxyphenylpropan- $\alpha$ -ol, and its phenylurethane, A., 505.  
 $\beta$ -3:4-Methylenedioxyphenylpropionic acid, ethyl ester, A., 505.  
 $\alpha$ -3:4-Methylenedioxyphenylsuccinimide, A., 843.  
 2-(3:4'-Methylenedioxy-styryl)dimethyl-1:4-benzopyrones, A., 858.  
 2-(3:4'-Methylenedioxy-styryl)-5-methyl-3-ethyl-1:4-benzopyrone, A., 858.  
 2-(3:4'-Methylenedioxy-styryl)-6-methyl-3-ethyl-1:4-benzopyrone, A., 620.  
 Methylene-3:3'-dicyclopentanone, and its semicarbazone, A., 53.  
 Methylene- $\beta\beta$ -ditetramethylenediamine, and its derivatives, A., 53.  
 $\gamma$ -Methylenedodecan- $\alpha$ -ol, and its derivatives, A., 1110.  
 $\gamma$ -Methylene- $\Delta^{\alpha}$ -dodecene, A., 1110.  
 4:7-endo-Methylenehexahydrohydrindene-1:3-dicarboxylic acids, and their derivatives, A., 938.  
 Methylene-hydrogen atom, mobile, substances containing, A., 516.  
 Methylene-ketones, hydroxy-, condensation of, with cyanoacetamide, and with semicarbazide, A., 521.  
 $\gamma$ -Methylene-pentan- $\alpha$ -ol, A., 1110.  
 3:6-endo-Methylene- $\Delta^4$ -tetrahydrophthalic acid, and its esters, synthesis of, A., 55.  
 3:6-endo-Methylene- $\Delta^1$ -tetrahydrophthalic anhydride, derivatives of, A., 938.  
 Methylene-*p*-toluidine, polymerism and structure of, A., 1124.  
 $\alpha$ -Methylene-*n*-valeramide, A., 1119.  
 Methylene-drine metho-bromide and -chloride, A., 380.  
 2'-Methyl-2-ethoxymethyltriphenylcarbinol, A., 613.  
 Methyl-ethylamine, b.p. of, A., 846.  
 $\gamma$ -(Methyl-ethylamino)propanol, b.p. of, and its benzoate hydrochloride, A., 846.  
 Methyl-ethyl-*tert*-butylcarbinol, dehydration of, A., 1232.  
 Methyl-( $\beta$ -ethylbutyl)(dimethylaminoethyl)-carbinol, A., 142.  
 4-Methyl-3-ethyl-2- $\beta$ -carboxyethylpyrrole-5-carboxylic acid, ethyl ester, A., 861.  
 2-Methyl-3-ethylchromones, nitro-, A., 519.  
 4-Methyl-3-ethyl-2- $\beta$ -dicarboxyethylpyrrole-5-carboxylic acid, ethyl ester, A., 861.  
 4-Methyl-3-ethyl-2- $\beta$ -dicarboxyvinylpyrrole-5-carboxylic acid, ethyl ester, A., 861.  
 5-Methyl-2-ethylfuran, A., 1255.  
 2-Methyl-5-ethylfuran-3-carboxylic acid, A., 1255.

- $\beta$ -Methyl- $\epsilon$ -ethylheptan- $\gamma$ -ol, and its acetate, A., 142.
- 1-Methyl-1-ethylcyclohexane-3:5-dione, derivatives of, A., 738.
- $\beta$ -Methyl- $\delta$ -ethylhexan- $\gamma$ -one, A., 831.
- 3-Methyl-2-ethylindole, and its dipicrate, A., 1236.
- Methyl ethyl ketone, density of, at low temperatures, A., 14.
- nitrophenylhydrazones, A., 402.
- $\beta$ -Methyl- $\beta$ -ethylmalic acid,  $\beta$ -lactone, A., 614.
- 2-Methyl-3-ethyl-1:4- $\beta$ -naphthapyrone, A., 1257.
- 1-Methyl-2-ethylcyclopentanes, stereoisomeric, A., 267.
- 1-Methyl-2-ethylcyclopentanol, A., 267.
- 1-Methyl-2-ethylcyclo- $\Delta^1$ -pentene, A., 267.
- 7-Methyl-1-ethylphenanthrene, A., 1255.
- 1-Methyl-2-ethylcyclopropane, A., 606.
- 1-Methyl-5-ethyl-2-pyrrolidone, A., 1141.
- 4-Methyl-2-ethylquinoline, and its picrate, A., 65.
- $\beta$ -Methyl- $\beta$ -ethylsuccinic acid,  $\beta$ -bromo-, and  $\beta$ -lactone, and its aniline salt, A., 614.
- Methylethylsulphinebenzenesulphonylimine, A., 529.
- Methylflavones, A., 858.
- Methylflavylium chlorides, 3:7:4'-trihydroxy-, A., 859.
- Methylfluorenes, A., 1121.
- 2-Methylfluorene-9-carboxylic acid, and its methyl ester, A., 1121.
- 2-Methylfluorenone, A., 1121.
- $\beta$ -Methyl- $d$ -fucoside, and its triacetyl derivative, A., 369.
- 1-Methylfucosides, A., 723.
- 2-Methylfuran, isomeride of, and its derivatives, A., 857.
- 2-Methylfuran, 5-nitro-, benzylidene derivative, A., 519.
- 3-Methylfuran, synthesis of, A., 166.
- 4-Methylfuran, 2-cyano-, A., 166.
- 5-Methylfuran, 2-chloro-, A., 858.
- 4-hydroxy-, A., 518.
- Methylfurans, 2-chloro- and 5-nitro-, A., 1255.
- 2-Methylfuran-5-carboxylic acid, 3-nitro-, methyl ester, benzylidene derivative, A., 519.
- 4-Methylfuran-5-carboxylic acid, and 2-cyano-, A., 166.
- 2-Methylfuran-3-carboxylic acid-5- $\alpha$ -propionic acid, A., 1255.
- 4-Methylfuran-2:3-dicarboxylic acid, A., 166.
- Methylfurfuraldehyde, determination of, as 2:4-dinitrophenylhydrazone, A., 763.
- Methylfurfuraldehyde, hydroxy-, presence of, as impurity in hexoses, A., 1020.
- 3-Methylfurfuraldehyde, and its derivatives, A., 166.
- 5-Methylfurfuryl chloride, A., 518.
- 2-Methyl-3-furoic acid, preparation of, A., 519.
- 2-Methyl-3-furoic acid, 5-bromo-, and 5-nitro-, A., 620.
- 5-chloro-, A., 858.
- 3-Methylfuroic acid, synthesis of, A., 166.
- 4-Methylfuroic acid, A., 166.
- 5-Methylfuroyl cyanide, A., 518.
- 5-Methylfuroylformic acid, A., 518.
- 5-Methylfurylacetic acid, A., 858.
- 5-Methylfuryl-2-acetonitrile, A., 518.
- 3-Methyl-2-furyl isobutyl ketone, synthesis of, A., 166.
- $\alpha$ -Methylgalactosidyl 6-bromide, A., 1237.
- Methyl- $d$ -galacturonide, preparation of, A., 1113.
- 3-O-Methylgallic acid. See 3-Methoxybenzoic acid, 4:5-dihydroxy-.
- $\alpha$ -Methylglucofuranoside, crystalline, and its derivatives, A., 1020.
- 4-Methylglucoheptose, and its derivatives, A., 724.
- Methyl- $\alpha$ -glucoheptoside, structure and derivatives of, A., 46.
- $\alpha$ -Methyl- $d$ -glucoheptuloside, and its pentaacetate, A., 724.
- 3-Methylgluconic acid, brucine salt, A., 500.
- 4-Methylglucosazone, A., 369.
- 2-Methylglucose, preparation of, and its  $\beta$ -methylglucoside, benzylidene derivative, A., 500.
- 3-Methylglucose, action of dilute alkali on, A., 500.
- 4-Methylglucose dibenzylmercaptal, A., 369.
- Methylglucoses, structure of, A., 254, 369, 1115.
- $\beta$ -Methylglucoside 4:6-diacetate 2:3-dibenzonate, A., 1115.
- $\gamma$ -Methylglucoside. See  $\alpha$ -Methylglucofuranoside.
- $\alpha$ - and  $\beta$ -Methylglucosides, hydrolysis of, A., 1286.
- Methylglucosidylxanthic acid, salts, A., 718.
- $\beta$ -Methylglutaconic acid,  $\alpha$ -substituted derivatives of, A., 252.
- Methylglyoxal, formation of, from hexose-phosphate, A., 91.
- heat of combustion of, A., 1091.
- oxidation of, in presence of hydrocyanic acid, A., 1114.
- to pyruvic acid, A., 1235.
- by catalytic action of hydrocyanic acid, A., 720.
- action of, on acetoacetic acid, A., 645.
- with weak alkaline solutions, A., 602.
- with nitrogen-free compounds, A., 1235.
- enzymic conversion of, into lactic acid, A., 1287.
- physiological action of, A., 1290.
- effect of, on tissue respiration, A., 1281.
- Methylglyoxaline, additive compounds of, with pilocarpine, A., 757.
- $\alpha$ -4-Methylglyoxalinylnmaleic acid, methyl ester, A., 1145.
- $\beta$ -Methylglyoxime,  $\alpha$ -iodo-, and its derivatives, A., 1146.
- Methylgossypolic acid, and its methyl ester, A., 1257.
- $\epsilon$ -Methylguanidohehoic acid, behaviour of, in the body, A., 300.
- Methyl- $d$ -gulosides, preparation of, and their derivatives, A., 369.
- $\beta$ -Methyl- $\Delta^{\beta\beta}$ -heptadien- $\beta$ -one, and its semicarbazone, A., 600.
- $\zeta$ -Methyl- $\Delta^{\gamma\epsilon}$ -heptadien- $\beta$ -one, and its oxime, A., 600.
- Methylheptanol  $p$ -iododiphenylurethane, A., 855.
- Methylheptenol  $p$ -iododiphenylurethane, A., 855.
- $d$ - $\gamma$ -Methylheptoic acid, and its ethyl ester, A., 360.
- $d$ -Methylheptoic acids, A., 365.
- Methylhexadienes, and their polymerides, A., 496.
- $\alpha$ -Methylhexadienoic acid, and its nitrile, A., 498.
- $\alpha$ -Methyl-*trans*-hexahydrindylidene-2-acetone, and its semicarbazone, A., 1034.
- $\alpha$ -Methyl-*trans*-hexahydrohydrindene-2-acetic acid, 2-hydroxy-, and its ethyl ester, A., 1034.
- $\alpha$ -Methyl-*trans*-hexahydrohydrindylidene-2-acetic acid, and its derivatives, A., 1034.
- $\alpha$ -Methyl-*trans*-hexahydroindeny-2-acetic acids, and their derivatives, A., 1034.
- 1-Methylhexahydrophthalic acid, A., 1036.
- 2-Methylhexamethyleneimine, and its benzoyl derivative, A., 1260.
- Methylhexane, and  $\alpha$ -bromo-, A., 360.
- Methylcyclohexane, equilibria of, with  $n$ -heptane and its determination in petroleum, B., 632.
- amino-alcohols derived from, A., 1126.
- Methylcyclohexane, 1-amino-1-amino-, dihydrochloride and diacetyl derivative, A., 256.
- Methylcyclohexane-1:1-diacetic acids, dissociation constants of, A., 572.
- and *mono*- and *di*-bromo-, derivatives of, A., 741.
- 4-Methylcyclohexane-1:1-dicarbamylacetic acid,  $\omega$ -imide of, A., 741.
- 2-Methylcyclohexane-3:5-dione-1(2')-*spiro*-*trans*-hexahydrohydrindene, A., 1034.
- cis*-Methylcyclohexanespiro-2'-methoxycyclopropane-2':3'-dicarboxylic acids, and their derivatives, A., 741.
- Methylcyclohexanespirocyclopropane-2':3'-dicarboxylic acids, and their derivatives, A., 741.
- $\beta$ -Methylhexanol, and its derivatives, B., 250.
- $d$ -3-Methylhexanol, A., 360.
- Methylcyclohexanol, 2-hydroxy-, and its derivatives, A., 1126.
- Methylcyclohexanols, stereomeric, formation of, and their nitrobenzoates, A., 156, 157.
- 2-Methylcyclohexanols, and their salts, A., 844.
- 2-Methylcyclohexanone, allylation and methylation of, and its derivatives, A., 161.
- condensation product of, with benzaldehyde, and its derivatives, A., 272.
- $d$ -3-Methylcyclohexanone, isomeric oximes of, and their benzoyl derivatives, A., 1133.
- $\alpha$ -Methylhexenoic acid, A., 1111.
- $\alpha$ -Methylhexenoic acids, and their ethyl esters, A., 1111.
- $\beta$ -Methyl- $\Delta^{\gamma}$ -hexenoic acid,  $\beta$ -hydroxy-, methyl ester, A., 600.
- trans*- $\beta$ -Methyl- $\Delta^{\epsilon}$ -hexenonitrile, and its amide, A., 1119.
- 2-Methyl- $\Delta^1$ -cyclohexenyl ethyl ether, 6-cyano-, A., 744.
- Methyl  $n$ -hexenyl ketone, and its semicarbazone, A., 1133.
- $\alpha$ -Methyl- $n$ -hexoic acid,  $\beta$ -hydroxy-, and its ethyl ester, A., 1111.
- $l$ - $\alpha$ -Methyl- $n$ -hexoic acid, A., 1233.
- $d$ - $\gamma$ -Methylhexoic acid, A., 365.
- and its ethyl ester, A., 360.
- $\beta$ -Methylhexonitrile,  $\beta$ -hydroxy-, A., 1119.
- 4-Methylcyclohexyl arsenite, A., 937.
- $l$ - $\beta$ -Methylhexylamine, A., 365.
- Methyl  $n$ -hexyl ketone, and its semicarbazone, A., 1133.
- 4-Methylcyclohexyl methyl ketone, 4-hydroxy-, semicarbazone, A., 277.
- Methylhomotropine, and its salts, A., 287.
- $N$ -Methylhomogranatoline, and its derivatives, A., 759.
- $N$ -Methylhomogranatoline, and its derivatives, A., 759.
- $p$ -Methylhydratropaldehyde, resolution of, A., 57.
- Methylhydrobenzoin iodohydrins, dehalogenation of, A., 394.
- 3-Methyl-1:2-dihydroxyanthraquinone, 4-chloro-, A., 617.
- $N$ -Methyl- $N$ - $\gamma$ -hydroxy- $\beta\beta$ -dimethylpropylaminoacetic acid, and its ethyl ester, A., 504.
- $N$ -Methyl- $N$ - $\gamma$ -hydroxy- $\beta\beta$ -dimethylpropylcarbamic acid, derivatives of, A., 504.

- Methylhydroxydiphenylmethanes, chloro-, and their antibacterial action, A., 1026.  
 Methyl  $\beta$ -hydroxyoctyl ketone, A., 831.  
 Methyl  $\beta$ -hydroxy-*n*-propyl ketoxime, A., 161.  
 Methylimides, determination of, microchemically, A., 291.  
 $\beta$ -1:5-Methyliminazoyl- $\alpha$ -phthalimido-propionic acid, A., 863.  
 $\beta$ -1:4-Methyliminazoyl- $\alpha$ -phthalylimino-propionic acid, A., 863.  
 1-Methylindazole-3-carboxylic acid, 6-nitro-, ethyl ester, A., 760.  
 1-Methylindole, 5:6-dihydroxy-, and its diacetyl derivative, A., 402.  
 2-Methylindolealdoxime acetate, A., 1261.  
 Methylindoleazo-*p*-phenylstibinic acids, and their salts, A., 954.  
 2-Methyl-3-indolylcarbinol, and its acetyl derivative, A., 1261.  
*l*- $\alpha$ -Methylidiiodotyrosine, A., 1130.  
 Methyl- $\beta$ -ionones, synthesis of, and their derivatives, A., 276.  
 2-Methyl- $\beta$ -lactamidoquinoline, and its methosulphate, A., 623.  
*p*-Methylmandelic acid, derivatives of, A., 521.  
*O*-Methylmandelic acid, esters of, and their derivatives, A., 287.  
 Methylmangostin, derivatives of, A., 397.  
 $\alpha$ -Methylmannoside, X-ray structure of, A., 798.  
 action of, with triphenylmethyl chloride, A., 146.  
 7-Methylmesoporphyrin, and its methyl ester, A., 174.  
 2-Methyl-6-*p*-methoxyphenylethyl-4-pyrone, A., 748.  
 Methylmethronic acid, constitution of, A., 1255.  
 Methyl  $\beta$ -methyldecyl ketone, and its semicarbazone, A., 832.  
 $\eta$ -Methyl- $\gamma$ -methylenooctan- $\alpha$ -ol, A., 1110.  
 $\eta$ -Methyl- $\gamma$ -methylene- $\Delta^4$ -octen- $\alpha$ -ol, A., 1110.  
 2-Methyl- $\alpha$ -methylglucoside, A., 45.  
 2-Methyl- $\gamma$ -methylglucoside, A., 500.  
 Methyl- $\beta$ -methylglucosides, and their acetyl derivatives, A., 255.  
 Methyl- $\gamma$ -methylisohexyl ketone semicarbazone, A., 612.  
 4-Methyl-2-(3'-methylcyclopentylidene)-cyclopentanone, and its semicarbazone, A., 740.  
 4-Methyl- $\alpha$ -naphthaldehyde semicarbazone, A., 941.  
 1-Methylnaphthalene, and 2:4-diamino-, diacetyl derivative, A., 840.  
 1-Methylnaphthalene, diamino-, and their derivatives, and *mono*-, *di*-, and *tri*-nitro-, A., 1122.  
 2-Methylnaphthalene, 4-chloro-, and its picrate, A., 507.  
 6:7-dihydroxy-. See Phyllomerol.  
 Methylnaphthalenes, synthesis of, A., 507.  
 Methylnaphthalenes, chloro-, condensation with, A., 1024.  
 1-Methylnaphthalene-3-carboxylic acid, 2:4-diamino-, ethyl ester, A., 840.  
 2-Methylnaphthalene-3-carboxylic acid, 6:7-dihydroxy-. See Phyllomeronic acid.  
 2-Methylnaphthalenecarboxylic acids, A., 1250.  
 4-Methyl-1:2- $\beta$ - $\alpha$ -naphthapyrone, nitro-, A., 1038.  
 4-Methylnaphthapyrone-3-acetic acids, and their derivatives, A., 519.  
 4-Methyl-1:2- $\alpha$ -naphthapyrone-6-arsinic acid, A., 761.  
 4-Methyl-1:2- $\alpha$ -naphthapyrone-6-azosulpho- $\alpha$ -naphthylarsinic acid, A., 1268.  
 1-Methyl-2:3-naphthaquinone, structure of, and 4-chloro-6-bromo-, hydrazone of, A., 1134.  
 6-Methyl-2-naphthoic acid, and its methyl ester, A., 839.  
 7-Methyl- $\alpha$ -naphthol, methyl ether, A., 948.  
 3-Methyl- $\alpha$ - $\beta$ -naphthoquinoxaline-2-carboxylic acid, ethyl ester, A., 952.  
 2-Methylperinaphthothiazine, A., 176.  
 $\beta$ -6-Methyl-2-naphthoylbutyric acids, and their methyl esters, A., 1024.  
 $\beta$ -(6-Methyl-2-naphthoyl)propionic acid, and its methyl ester, A., 839.  
 6-Methyl-2-naphthyl  $\alpha$ -bromoethyl ketone, A., 1024.  
 $\gamma$ -(6-Methyl-2-naphthyl)butyric acid, A., 839.  
 6-Methyl-2-naphthyl ethyl ketone, A., 1024.  
 (Methylnaphthylidene)dimethylnaphthalene,  $\omega$ -nitro-, A., 941.  
*o*-2-Methyl- $\alpha$ -naphthylmethylbenzoic acid, A., 1136.  
 $\gamma$ -6-Methyl-2-naphthyl- $\alpha$ -methyl- $\Delta^{\beta}$ -pentenoic acid, A., 1024.  
 $\gamma$ -(6-Methyl-2-naphthyl)- $\Delta^{\beta}$ -pentenoic acid, A., 839.  
 6-Methylnicotinic acid, preparation of, and its derivatives, A., 401.  
 Methyl-3-nitrophthalimide, A., 1231.  
 Methyl nitrosoisopropyl ketone, A., 602.  
 4-Methyl-2- $\beta$ -nitrovinylpyrrole-3:5-dicarboxylic acid, ethyl ester, A., 861.  
*l*-8-Methylnonane, A., 360.  
*l*- $\alpha$ -Methyl-*n*-nonoic acid, A., 1233.  
*l*- $\gamma$ -Methylnonoic acid, and its ethyl ester, A., 360.  
*l*-Methylnonoic acid, A., 365.  
 Methylnorlupinanyluethane, and its hydrochloride, A., 178.  
 $\beta$ -Methylnortropylpropionic acid, 2-hydroxy-, ethyl ester, and its salts, A., 759.  
 $\beta$ -Methyl- $\Delta^{\gamma\epsilon}$ -octadienoic acid,  $\beta$ -hydroxy-, methyl ester, A., 600.  
 $\alpha$ -Methyl- $\Delta^2$ -trans-octahydronaphthyl-2-acetone, and its semicarbazone, A., 1033.  
 2-Methyl-1:2:3:4:9:10:11:12-octahydrophenanthrene, A., 1241.  
 $\beta$ -Methyl- $\Delta^{\gamma\epsilon}$ -octatrienoic acids, A., 600.  
*l*- $\gamma$ -Methyloctic acid, and its ethyl ester, A., 360.  
 Methyloctic acids, A., 365.  
 Methyl *n*-octyl ketone in oil of rue, A., 1179.  
 Methylostruthin, and its derivatives, A., 751.  
 Methylostruthinic acid, A., 751.  
 Methyl-1:2:5-oxadiazole, 3-oximino-, A., 1267.  
 5-Methylisooxazole-3-carboxylazide, A., 1145.  
 5-Methylisooxazole-3-carboxylhydrazide, A., 1145.  
 5-Methylisooxazole-3-carboxylic acid, Curtius degradation of, A., 1145.  
 5-Methylisooxazole-5-urethane, A., 1145.  
 Methylisopelletierine, identity of, with  $\alpha$ -2-*N*-methylpiperidylpropan- $\beta$ -one, A., 628.  
 Methylcyclopentamethylarsine dichloride, A., 528.  
 Methylcyclopentamethylenestibine, and its dichloride, A., 528.  
 $\beta$ -Methylpentane,  $\beta$ -dibromo-, A., 277.  
 Methylcyclopentane, formation of, from cyclohexane, A., 938.  
 isolation and determination of, in petroleum, B., 169.  
 2-Methylcyclopentanecarboxylic acid, derivatives of, A., 50.  
 3-Methylcyclopentane-1:1-diacetic acid, and *mono*- and *di*-bromo- and  $\alpha\alpha'$ -dihydroxy-, and their derivatives, A., 740.  
 3-Methylcyclopentanespiro-3':4'-diketocyclopentane-2':5'-dicarboxylic acid, derivatives of, A., 740.  
 $\gamma$ -Methylpentane- $\alpha$ -diol, A., 1110.  
*cis*-3-Methylcyclopentanespiro-2-methoxycyclopropane-2':3'-dicarboxylic acids, and their anhydrides, A., 740.  
 3-Methylcyclopentanespirocyclopentane-2':4'-dione, and bromo-, A., 740.  
 3-Methylcyclopentanespirocyclopentane-3':4'-dione, and its disemicarbazone, A., 740.  
 3-Methylcyclopentanespirocyclopropane-2':3'-dicarboxylic acids, and their derivatives, A., 740.  
 $\beta$ - and  $\delta$ -Methylpentanols, and their derivatives, B., 250.  
 3-Methylcyclopentane-1-ol-1-acetic acid, and its ethyl ester, A., 740.  
 3-Methylpentanol- $\beta$ -*d*-glucoside, and its hydrolysis by emulsin, A., 1165.  
 3-Methylcyclopentanone, derivatives of, A., 740.  
 $\beta$ -Methyl- $\Delta^{\beta}$ -pentene,  $\epsilon$ -bromo-, A., 277.  
 Methylpentenes, and their dibromides, A., 361.  
 $\alpha$ -Methyl- $\Delta^{\alpha}$ -penteuamides, A., 1119.  
 $\gamma$ -Methyl- $\Delta^{\gamma}$ -penten- $\alpha$ -ol, A., 1110.  
 $\gamma$ -Methyl- $\Delta^{\beta}$ -pentenonitrile, A., 1119.  
 Methyl- $\Delta^{\delta}$ -pentenyl-*n*-hexylamine, and its picrate, A., 48.  
 Methyl- $\Delta^{\delta}$ -pentenyl-*n*-octylamine, and its salts, A., 48.  
 Methylpentosides, reaction of, with triphenylmethyl chloride, A., 146.  
 3-Methylcyclopentylideneacetic acid, A., 740.  
 2-Methylcyclopentyl methyl ketone semicarbazone, A., 50.  
 2-Methylcyclopentyl propyl ketone, and its semicarbazone, A., 50.  
 Methylphosphoribide *a*, derivatives of, A., 756.  
 Methylphosphoribide *b*, derivatives of, A., 1264.  
 semicarbazone, A., 174.  
 $\alpha$ -Methylphenacylbenzylidimethylammonium iodide, A., 854.  
 Methylphenanthrenes, and their derivatives, A., 608.  
 9-Methylphenanthridine, 3-amino-, and its acetyl derivative, A., 1041.  
 9-Methylphenanthridines, nitro-, A., 1041.  
 10-Methylphenarsazine, 10:10-dihydroxy-, and its oxide, A., 630.  
 2-Methylphenarsazinic acid, 7-nitro-, A., 181.  
 Methylphenols, *di*- and *tri*-hydroxy-, A., 610.  
 2-Methyl-3- $\beta$ -phenoxyethylindole, A., 288.  
 Methyl- $\beta$ -phenoxyethylpiperidinium salts, A., 622.  
 4-Methyl-3- $\beta$ -phenoxyethylpyridine, 2:6-dihydroxy-, A., 951.  
 Methyl- $\beta$ -phenoxyethylpyrrolidinium iodide, A., 622.  
 Methyl- $\beta$ -phenoxyethylpyrrolinium iodide, A., 622.  
 Methyl  $\epsilon$ -phenyl-*n*-amyl ketone, and its semicarbazone, A., 272.  
 $\gamma$ -Methyl- $\alpha$ -phenylbutadiene, dimeride of, A., 496.  
 Methyl- $\delta$ -phenyl- $\Delta^{\gamma}$ -butenyl ketone, and its semicarbazone, A., 272.  
 3-Methyl-2:1-phenylenethiazthionium chloride, 5-chloro-, A., 525.  
 4-Methyl-2- $\beta$ -phenylethylcyclohexanol, A., 1241.  
 4-Methyl-2- $\beta$ -phenylethylcyclohexanone, and its semicarbazone, A., 1241.  
 4-Methyl-2- $\beta$ -phenylethylcyclohexanone-2-carboxylic acid, ethyl ester, A., 1241.

- Methyl- $\beta$ -phthalimidoethylmalonic acid, esters of, A., 288.
- Methylpimanthrene, constitution of, A., 1254.
- Methylpiperidine, 2-amino-, dihydrochloride, A., 256.
- $\alpha$ -2-N-Methylpiperidylpropan- $\beta$ -one, identity of, with methylisopelletierine, A., 628.
- $\beta$ -Methylpiperidylpropionic acid, 3-hydroxy-, derivatives of, A., 759.
- $\beta$ -Methylpropane,  $\alpha\beta$ -diamino-, and its salts and derivatives, A., 256, 728.
- 3-Methylcyclopropane-1,2-dicarboxylic acid, derivatives of, A., 1247.
- 1,2-Methyl-5-isopropenyl- $\Delta^2$ -cyclohexenone, and its derivatives, A., 62.
- 6-Methyl-3-isopropylbenzaldehydes, hydroxy-, and their semicarbazones, A., 946.
- Methylisopropylcarbinol, configuration of, A., 1109.
- 2-Methyl-3-propylchromones, bromo-, chloro-, and nitro-, A., 519.
- Methylisopropylidiphenylcarboxylic acid, A., 943.
- $\beta$ -Methyl- $\delta$ -propylheptan- $\gamma$ -one, A., 831.
- $d$ - $\beta$ -Methyl- $\epsilon$ - $n$ -propylhexane, A., 360.
- 1-Methyl-2-propylcyclohexane, A., 258.
- 1,3-Methyl-5-isopropylcyclohexanones, isomeric, and their derivatives, A., 62.
- Methyl propyl ketone 2,4-dinitrophenylhydrazones, A., 1239.
- 2-Methyl-3-propyl-1,4- $\beta$ -naphthapyrones, A., 1257.
- 3-Methyl-isopropylphenol, A., 735.
- 2-(5-Methyl-2-isopropylphenyl)-4-methylquinoline, 2,4-hydroxy-, A., 403.
- 2-(5-Methyl-2-isopropylphenyl)quinoline, 2,4-hydroxy-, A., 403.
- 2-(5-Methyl-2-isopropylphenyl)quinoline-4-carboxylic acid, 6-bromo-2,4-hydroxy-, and 2,4-hydroxy-, A., 403.
- 1-Methyl-2-propylcyclopropane, A., 606.
- Methyl-2-propylquinolines, and their salts, A., 65.
- 4-Methylpyrazoline-3-carboxylic acid, derivatives of, A., 1143.
- Methylpyrazolinecarboxylic acids, and 4-trichloro-, derivatives of, A., 863.
- 4-Methylpyrazoline-3,5-dicarboxylic acid, ethyl ester, A., 1143.
- Methylpyrazolinedicarboxylic acids, ethyl esters, A., 863.
- Methylpyridines, amino-, and their salts, A., 187.
- 2-Methylpyridine-3:4:5:6-tetracarboxylic acid, methyl ester, A., 1144.
- N-Methyl-4-pyridone, 3:5-diiodo-, A., 622.
- Methylpyromellitic acid, and its derivatives, A., 851.
- Methylpyrophosphoribide, A., 174.
- 2-Methylpyrrole, action of, with methyl acetylenedicarboxylate, A., 1144.
- 2-Methylpyrrole, 3-cyano-, and its derivatives, A., 1260.
- 2-Methylpyrrole-5-carboxylic acid, derivatives of, A., 282.
- 2-Methylpyrrole-5-carboxylic acid, 3-cyano-, ethyl ester, A., 1260.
- 2-Methylpyrrole-3:5-dicarboxylic acid, derivatives of, A., 281.
- 1-Methylpyrrolone-5-carboxylic acid, ethyl ester, A., 521.
- 2-Methylquinoline, synthesis of, under physiological conditions, A., 1046.
- 4-Methylquinoline, 2-chloro-, condensation product of, with anthranilic acid, and its derivatives, A., 66.
- 6-Methylquinoline-4-carboxylic acid, A., 754.
- 2-Methylquinolinecarboxylic acids, derivatives of, A., 522.
- 2-Methylquinoliniumallyl salts, A., 1261.
- $\beta$ -6-Methyl- $\delta$ -quinolylamino- $\alpha$ -dimethylaminopropane dihydrochloride, A., 1040.
- N-2'-Methyl-4'-quinolylanthranilic acid, A., 66.
- Methyl-red, dissociation constant of, in potassium chloride solutions, A., 809.
- as adsorption indicator, A., 589.
- Methylretene, constitution of, A., 1254.
- Methylrotenononic acid, and its derivatives, A., 1039.
- 4-Methylsalicylic acid, 5-nitro-, derivatives of, A., 734.
- Methylsinoemic acid, and its barium salt, A., 628.
- $\beta$ -Methylsorbic acids, and their methyl esters, A., 600.
- $\delta$ -Methylsorbic acid, and its ethyl ester, A., 600.
- $\alpha$ -Methylstilbene oxide, A., 394.
- N-Methylchano- $\beta$ -strychnine, and its derivatives, A., 1147.
- Methylneostrychninium salts, A., 527.
- $p$ -Methylstyryl *tert*-butyl ketone, A., 158.
- Methylsuccinic acid, *l*-bornyl hydrogen ester, A., 252.
- N-Methyl-*O*-tetra benzoylpapaverolinium chloride, A., 527.
- 3-Methyl-1:4:11:12-tetrahydroanthraquinone, 2-chloro-, A., 1232.
- Methyltetrahydroderitol, and its derivatives, A., 400.
- Methyltetrahydrofuran, 2-bromo-, and its acetate, A., 166.
- $\gamma$ -Methyltetrahydronaphtho- $\alpha$ -pyrone, A., 64.
- 4-Methyl-1:2:3:4-tetrahydrophenanthrene, 4-hydroxy-, and its picrate, A., 608.
- 3-Methyl- $\Delta^4$ -tetrahydrophthalic anhydride, A., 141.
- dl*-4-Methyl-1:2:3:4-tetrahydroquinoline, 6-amino-, and its dipicrate, A., 1261.
- Methylcycloctetramethylenearsine dichloride, A., 528.
- $\beta$ -Methyl-*aaa'*-tetraphenyldiethylene dioxide, A., 363.
- 1-Methyltetrazole, 5-amino-, and its derivatives, A., 1043.
- 5-thiol-, mercury salt, A., 405.
- 4-Methylthiazole, 2-thiol-, salts of, A., 68.
- N-Methylthiodiphenylamine, mercuri-salts, and 2:7-dibromo-, and 2-iodo-, A., 631.
- N-Methylthiodiphenylamine-2-arsenious chloride, A., 631.
- N-Methylthiodiphenylamine-2-arsinic acid, A., 631.
- N-Methylthiodiphenylamine-2:7-diarsenious chloride, A., 631.
- N-Methylthiodiphenylamine-2:7-diarsinic acid, A., 631.
- 2-Methylthiolacetophenone, and its phenylhydrazones, A., 280.
- o*-Methylthiolnaphthoylbenzoic acid, and 4-bromo-, A., 842.
- 2-Methylthiolrotic acid, A., 952.
- 4-Methylthiolphenyl 2-hydroxy-1-naphthyl sulphide, A., 735.
- 4'-Methylthiolphenyl-2-hydroxy-1-naphthyl sulphone, A., 735.
- 2-Methylthiol-1:8-phthalynaphthalene, A., 842.
- 2-Methylthiolthiophen, and its 5-halogeno-mercuri-derivatives, A., 752.
- Methylthionaphthindoles, A., 280.
- 2-Methylthiophens, substituted, preparation of, A., 950.
- dl*-*O*-Methylthyroxine, A., 1130.
- 4-Methyl-2-( $\beta$ -*o*-tolylethyl)cyclohexanol-2-carboxylic acid, ethyl ester, A., 1241.
- 4-Methyl-2-( $\beta$ -*o*-tolylethyl)cyclohexanone-2-carboxylic acid, ethyl ester, A., 1241.
- Methyltri-*n*-amylarsonium antimonyl *d*-tartrate, A., 866.
- $\beta$ -Methyltricosane, slow combustion of, A., 1231.
- $\beta$ -Methyltricosan- $\beta$ -ol phenylurethane, A., 1231.
- Methyltriethylarsonium antimonyl *d*-tartrate, A., 866.
- 1-Methyl-2:5:5-triethyl- $\Delta^2$ -pyrroline, A., 622.
- Methyltri-*n*-propylarsonium antimonyl *d*-tartrate, A., 866.
- Methyltri-*n*-propylstibonium antimonyl *d*-tartrate, A., 866.
- O*-Methyltropic acid, esters, and their derivatives, A., 287.
- Methyltryptamines, synthesis of, and their derivatives, A., 289.
- $\beta$ -Methylundecic acid, and its salts and derivatives, A., 832.
- $\beta$ -Methylundecic acid,  $\beta$ -hydroxy-, ethyl ester, A., 832.
- Methyluracil-4(6)-carboxylic acid, and its esters, A., 66.
- Methyluvinic acid, constitution of, A., 1255.
- $\alpha$ -Methylisovaleraldehyde, formation of, from ergosterol, and its dinitrophenylhydrazone, A., 267.
- semicarbazone, A., 612.
- $\alpha$ -Methylvaleric acid, and its amide, A., 44.
- l*- $\alpha$ -Methyl-*n*-valeric acid, A., 1233.
- $\alpha$ -Methylisovaleric acid, silver salt, A., 267.
- dl*- $\beta$ -Methyl-*n*-valeryl glycine,  $\alpha$ -bromo-, A., 605.
- $\beta$ -Methyl-*n*-valeryl-leucines,  $\alpha$ -bromo-, A., 605.
- dl*- $\beta$ -Methyl-*n*-valeryl-*l*-tyrosine,  $\alpha$ -bromo-, A., 605.
- 3-Methyl-5-vinylpyrazoline, and its salts, A., 754.
- Methyl-violet, adsorption of, from solution, by charcoal, A., 1199.
- Methylvomicine, A., 179, 408.
- N-Methylvomicinic acid, methyl ester, A., 408.
- Methylxanthic acid, salts of, A., 718.
- Methyl-*o*-xenyl. See Carbamic acid, methyl-2-diphenyl ester.
- $\alpha$ -Methylxyloside, crystal structure of, A., 1192.
- $\beta$ -Methylxyloside, X-ray structure of, A., 326.
- $\alpha$ -Methyl-*d*-xyloside- $\beta$ -methyl-*d*-xyloside, A., 148.
- Mica, constitution of, A., 715.
- powdering of, (P.), B., 678.
- transparency of, to ultra-violet light, A., 211.
- orientation of crystals on, A., 326.
- production of flakes of, (P.), B., 678.
- flexible products of, for electrical insulation, (P.), B., 353.
- production of insulating materials from, (P.), B., 1039.
- green, A., 1107.
- muscovite, determination of refractive index of, A., 247.
- Mice, albino, as test animals for anti-neuritic vitamins, A., 97.
- white, variation of nucleo-cytoplasmic ratio of, with age, A., 772.
- effects of overdosage of vitamins on, A., 783.
- Micelles, theory of, A., 121.
- Microchemistry, A., 33.
- glass apparatus for, A., 1226.
- fluorescence analysis in, A., 33.
- preparative, A., 358.

**Microcline**, of Klesów, A., 1229.  
of Maczulanka, A., 1229.

**Microcondensers**. See under Condensers.

**Microdilatometer**, isothermal, A., 925.

**Micro-distillation**. See under Distillation.

**Micrograph**, Röntgen-ray, A., 713.

**Micro-organisms (microbes)**, growth of, A., 196.  
inhibition of development of, (P.), B., 173.  
decomposition of fats by, A., 93.  
nitrate accumulation by, A., 1169.  
decomposition of proteins by, A., 968.  
action of thiocyanates on, A., 778.  
biochemistry of, A., 195, 651, 1289.  
effect of  $p_{\text{H}}$  on toxicity of preservatives to, A., 431; B., 446.  
relation of constitution to action on, A., 95.  
in peat, A., 1067.  
soil, influence of development of higher plants on, B., 74.  
in relation to roots, B., 907.  
agar media for counting of, A., 94.

**Microphotometer**, photo-electric, for X-rays, A., 788.

**Micropterus salmoides**. See Bass, black.

**Microscopes**, electrically heated warm stage for, A., 37.  
electron, A., 209.

**Microscope-centrifuge**, A., 924.

**Microscopic sections**, from frozen paraffin blocks, A., 550.

**Microscopy**, fluorescence intra-vital, A., 424.

**Milarite**, beryllium in, A., 1107.

**Mildew**, prevention of formation of, on foods, (P.), B., 816.  
formation of "diamond spot" stains by B., 59.

**Milk**, standards for, under the Burma Food and Drugs Act 1923, B., 1052.  
composition of, B., 365.  
detection of derangements in, (P.), B., 785.  
influence of climate on yield and composition of, A., 1276.  
secretion of, A., 1154.  
influence of vitamins on formation of, A., 1276.  
effect of maize oil on production of, A., 1155.  
treatment of, (P.), B., 1006.  
separation of casein and albumin in, B., 159.  
changes in milk fat due to drying of, B., 861.  
heating of, B., 1102.  
determination of degree of, B., 748.  
heating or cooling apparatus for, (P.), B., 292.  
pasteurisation of, B., 239, 575, 860; (P.), B., 785, 959.  
plant for, in bottles, (P.), B., 160.  
by an electric current, B., 1005.  
tests for, B., 1133.  
pasteurisation and cooling of, B., 574.  
pasteurised by "holder" process, thermophilic bacteria in, B., 783.  
effect of pasteurisation on vitamin-C in, in presence of metals, B., 78.  
effect of pasteurisation and sterilisation on composition and biological properties of, B., 748.  
aëration of, with carbon dioxide, (P.), B., 160.  
variation in properties of, A., 1276.  
irradiation of, with ultra-violet rays, (P.), B., 526.  
fluorescence of, in ultra-violet light, B., 655.

**Milk**, electrical conductivity of, B., 366.  
in testing, B., 1102.  
freezing point of, B., 700.  
in relation to protein coagulation, A., 533.  
preservation of, for freezing-point determinations, B., 1052.  
refrigeration apparatus for, (P.), B., 960.  
cryoscopy of, B., 748.  
cryoscopy and refractometry of, B., 1005.  
determination of physical curd character of, (P.), B., 1006.  
coagulation of, by bacteria, A., 968.  
by heat, B., 1005.  
by rennin, A., 533.  
variation in constants of, during the cycle, B., 366.  
solubility of metals in, B., 45, 320.  
residual-current measurements in control of solution of copper in, B., 78.  
corrosion of metals by, B., 320, 470, 525, 844.  
reduction of methylene blue in, A., 533.  
alcohol-soluble constituents and serological activity of, A., 78.  
calcium phosphate in, A., 78.  
utilisation of calcium and phosphorus in, A., 423.  
dehydrogenating enzymes of, A., 302.  
fat content of, in relation to its composition, B., 283.  
relationship between fat content, specific gravity, and total solids of, B., 127.  
effect of milking on lactose and chloride in, A., 416.  
effect of diet on manganese in, A., 78.  
phosphatides in, B., 1133.  
effect of phosphatide diet on phosphatide content of, A., 638.  
proteins of, B., 1133.  
coagulation of, and depression of the freezing point, B., 1005.  
determination of, by formaldehyde titration, A., 1154.  
dry solids in, B., 574, 783.  
effect of season on accuracy of calculations of solids-not-fat in, B., 1005.  
relation between sugar content, chloride content, and serum refraction of, B., 45.  
vitamin-B in, A., 1069.  
vitamins in, A., 416.  
effect of vitamin value of, on growth, digestion, and metabolism of calves, A., 1282.  
antineuritic potency of derivatives of, B., 45.  
biochemical activators of, A., 1276.  
action of pepsin on, A., 1287.  
effect of lactic acid streptococci on, B., 748.  
production of effervescent beverages from, (P.), B., 240.  
manufacture of food products from, (P.), B., 622.  
production of stable powder from, (P.), B., 160.  
solid preparations of, (P.), B., 446.  
manufacture of bottles of standard weight for, (P.), B., 384.  
sanitation of churns for, B., 45.  
diet of. See under Diet.  
value of, for poultry feeding, A., 783.  
digestibility of, A., 423.  
effect of feeding dairy cows on milk or fat in, B., 574.  
cause of malt flavour in, B., 45.  
American buffalo's, A., 1055.  
animal, adjusting composition of, to that of woman's milk, (P.), B., 47.

**Milk**, artificial, centrifuged and natural, nutritive value of, A., 538.  
boiled, antineuritic vitamins in, B., 861.  
cows', production of, in heat, A., 1155.  
effect of cod-liver oil on, A., 1155.  
content of butter-fat in, A., 185.  
calcium and phosphoric acid in, A., 766.  
effect of maize and sunflower silages on yield and fat content of, B., 283.  
phosphate fractions of, A., 1276.  
fed with irradiated yeast, antirachitic value of, A., 1276.  
autoclaved, nutrition with, and with vitamins-B, -C, and -D, A., 200.  
cows' and goats', indian in, A., 185.  
indoxyl in, A., 295.  
vitamin-C in, A., 657.  
cows' and human, distinction between, B., 366.  
determination in, of iron, A., 1276.  
cows' and soya-bean, nutritive value of, A., 84.  
deficient in solids-not-fat, B., 1052.  
dogs', production of, in relation to food proteins, A., 958.  
dried, digestibility of protein of, B., 320, 525.  
evaporated, manufacture of, (P.), B., 656.  
effect of freezing on food value of, B., 574.  
heat-stable and heat-labile fractions of vitamin-B in, B., 911.  
ewes', examination of, B., 366.  
adulteration of, with cows' milk, B., 283.  
fresh, dialysable nitrogenous constituents of, A., 533.  
goats', effect of thyroidectomy and gland extracts on secretion of, A., 1155.  
human, A., 958, 1055, 1275.  
yield and fat content of, A., 871.  
action of parathyroid hormone on calcium content of, A., 655.  
sugars in, A., 416.  
with reference to diet, A., 1055.  
irradiated, antirachitic activity of, A., 312, 973.  
content of vitamin-D in, A., 548.  
malted, liquid, manufacture of, (P.), B., 446.  
mares', composition of, B., 44.  
pasteurised, growth of thermophilic bacteria in, in relation to public health, B., 1005.  
boiled, and sterilised, identification of, B., 748.  
detection in, of under-pasteurised milk, B., 959.  
protein-free, effect of heat on vitamin-B<sub>2</sub> in, A., 434.  
reconstituted, detection of, B., 959.  
ropy- and bitter-, destruction of organisms in, with hypochlorites, B., 283.  
skim, effect of sucrose on viscosity of, A., 465.  
effects of heating and agitating milk before separation on fat loss in, B., 784.  
feeding value of, compared with fish meal, A., 84.  
dried, growth-promoting value of, A., 962.  
sterilised, production of, in the laboratory, B., 621.  
sour, bacteria in, B., 959.  
analysis of, B., 239.  
sweet, artificial, production of, (P.), B., 240.  
Turkish yoghurt, B., 284.



- Milk**, sampling of, for fat test, B., 574.  
 testing of, with Jolles' reaction, A., 766.  
 determination of vitality of starters for, B., 784.  
 nephelometric examination of, B., 239.  
 analysis of, B., 525, 784.  
 refractometry of lead serum for, B., 1052.  
 detection in, of alkaline adulterants, B., 78.  
 of catalase, B., 1052.  
 of disease conditions, (P.), B., 127.  
 of sucrose, B., 204.  
 of water, by determination of chlorine, B., 1052.  
 determination in, of citric acid, B., 861.  
 of fat, B., 78; (P.), B., 996.  
 of  $p_H$ , colorimetrically, A., 1055.  
 of iron, B., 78.  
 and its products, of lactic acid, B., 1052.  
 of lactose, A., 872; B., 1052.  
 and its products, iodometrically, B., 700.  
 of zinc, A., 638.  
**Milk fat**, manufacture of, from butter, (P.), B., 899.  
 effect of balanced rations on, A., 1055.  
**Milk industry**, B., 239.  
**Milk powder**, physico-chemical constitution of, B., 159.  
 determination in, of fats, B., 861.  
**Milk products**, (P.), B., 1006, 1053.  
 manufacture of, (P.), B., 286.  
 containing vegetable fats, manufacture and preservation of, (P.), B., 47.  
**Mills**, attrition, (P.), B., 453.  
 ball, (P.), B., 1060.  
 laboratory, A., 593.  
 vibratory, (P.), B., 132.  
 ball- and pebble-, B., 484.  
 crushing, (P.), B., 3, 821.  
 pan for, (P.), B., 3.  
 ball, (P.), B., 212.  
 grinding, (P.), B., 132, 453, 485, 532, 628, 629, 661, 708, 867, 916.  
 cooling of, (P.), B., 405.  
 for colours, inks, enamels, etc., (P.), B., 197.  
 for liquid or semi-liquid materials, (P.), B., 3, 1108.  
 roller, grinding elements for, (P.), B., 3.  
 hammer, (P.), B., 2, 85, 485, 532, 661, 788.  
 pulverising, (P.), B., 405, 532, 788.  
 exclusion of dust from roller spindles of, (P.), B., 294.  
 lubrication of pendulum rollers of, (P.), B., 213.  
 rolling, piercing point, plug, and guide for, (P.), B., 188.  
 tube, (P.), B., 580.  
**Millet**, proteins of, A., 664.  
**Mines**, carbon dioxide explosions in, B., 630.  
 prevention of coal-dust explosions in, B., 133.  
 removal of dust from air in, B., 210.  
 effect of nature of coal on formation of explosive gases in, B., 533.  
**Minerals**, flotation of, B., 427, 470.  
 washing of, (P.), B., 170.  
 washing and separating apparatus for, (P.), B., 217.  
 separation of heavy constituents from, (P.), B., 580.  
 of different specific gravities, separation of, with heavy liquids, A., 246.  
 colour of, A., 33.  
 fluorescence of, under Wood's light, A., 1230.  
**Minerals**, protective coating for specimens of, A., A., 38.  
 solution and dispersion of, in water, A., 714.  
 of Big Snowy Mts., California, A., 248.  
 of Brazil, A., 493.  
 Canadian, B., 598.  
 carbonaceous, classification of, A., 716.  
 ferro-titaniferous, from the Arabian desert, A., 829.  
 of Katzenbuckel Mtn., Odenwald, A., 595.  
 oölitic, of Lorraine, A., 493.  
 Portuguese, radium content of, A., 494.  
 of the pyrochlore-romeite group, A., 596.  
 telluride, at Kalgoorlie, A., 495.  
 of the Wellington district, N.S. Wales, A., 248.  
**Miotines**. See  $\alpha$ -Phenylethyldimethylamines, *m*-hydroxy-.  
**Mirrors**, photodichroic, production of, A., 918.  
 small, silvering of, A., 245.  
*Miscanthus sinensis*, lime disintegration of hay of, B., 46.  
**Mists**, formation of, A., 453, 906.  
 removal of, from gases, (P.), B., 1109.  
 electrical properties of, A., 993.  
**Mixers**, (P.), B., 485.  
**Mixing**, calculations for, B., 820.  
**Mixing apparatus**, (P.), B., 85, 244, 324, 405, 453, 629, 661, 821, 822, 867, 916, 964, 1060.  
 thermostatic valves for, (P.), B., 821.  
 with automatic control, (P.), B., 373.  
 for liquids, (P.), B., 4, 244, 1108.  
 for pulverulent materials, (P.), B., 867.  
 centrifugal, (P.), B., 293.  
 vat, (P.), B., 789.  
**Mixtures**, insoluble, fusion of, in analysis, A., 824.  
 non-aqueous, fluidity of, A., 330.  
**Moeller-Barlow disease**, distinction between scurvy and, A., 1173.  
**Moisture**. See Water.  
**Molasses**, influence of organic non-sugars on formation of, B., 1003.  
 bleaching of, (P.), B., 42.  
 clarification of, for production of pressed yeast, (P.), B., 524.  
 disposal of residues from distillation of, (P.), B., 754.  
 relationship between ash content and electrical conductance of, B., 1100.  
 determination of density of, B., 572.  
 determination of decolorising power of adsorbents with, B., 480.  
 preparations of solutions of, of standard colour, B., 396.  
 colloids in, B., 442.  
 fermentation of, A., 147.  
 influence of adsorbents on, B., 203.  
 as a fertiliser, B., 953.  
 beet, manures for, B., 856.  
 determination in, of sulphur dioxide, B., 1049.  
 of water, by distillation with perchloroethylene, B., 1100.  
 cane, relationship between hydrometric and refractometric degree Brix in, B., 1049.  
 viscosity of, B., 442.  
 rich in lime, crystallisation of, B., 654.  
 identification of, with Wood's light, B., 783.  
 use of lead acetate in analysis of, B., 524.  
 determination of, in feeding-stuffs, B., 480.  
 determination in, of water, B., 41, 524.  
**Molecular dissymmetry**, A., 1039.  
 field, hypothesis of, A., 449.  
 Weiss', A., 563.  
 quantities, partial, calculation of, A., 997.  
 symmetry and diffusion spectra, A., 320.  
**Molecules**, structure of, from diffraction of electrons, A., 1078.  
 and electric moments, A., 110, 899, 984.  
 and dipole moments, A., 676.  
 lattice dimensions of, A., 111.  
 measurement of layers of, A., 460.  
 reflexion of beams of, A., 1073.  
 diamagnetism of, A., 1191.  
 surface activity and electrical properties of, A., 993.  
 flow of, A., 894.  
 collisions of, with electrons, A., 317.  
 dissociation of, by electron impact, A., 554.  
 energy levels of, A., 902.  
 energy exchanges between, A., 566.  
 energy of linkings of, A., 563.  
 transference of energy of activation between, A., 562.  
 chemical linking in, A., 449.  
 spatial configuration of, A., 272.  
 valency- and deformation-oscillations of, A., 559, 675.  
 as Fitzgerald oscillators, A., 445.  
**diatomic**, electron distribution in, A., 902.  
 Ramsauer effect for, A., 894.  
**pentatomic tetrahedral**, vibrations of, A., 107.  
**polyatomic**, structure of, A., 1190.  
 electronic structure and valency of, A., 562, 902.  
 entropy of, A., 14.  
 compact, A., 679.  
 complex, A., 984.  
 covalent, interatomic distances in, A., 562.  
 macro-, properties of, A., 993, 1201.  
 organic, structure of, in relation to modern atomic theory, A., 10.  
 polar, surface activity and orientation of, A., 569, 992.  
 simple, unimolecular decomposition of, A., 915.  
 symmetrical triatomic, vibrational levels of, A., 982.  
*Molge marmorata*. See Salamander, marble.  
**Molisch's reaction**, A., 145, 933.  
**Molybdates**. See under Molybdenum.  
**Molybdenite**, reduction of, (P.), B., 989.  
**Molybdenum**, production of, from its carbonyl, (P.), B., 472.  
 in steel and iron, B., 469.  
 recovery of, from its ores, (P.), B., 775.  
 from its compounds and mixtures with other metals, (P.), B., 981.  
 K X-ray spectrum of, A., 316.  
 radiation from, on electronic bombardment, A., 1184.  
 photo-electric and thermionic data for, A., 1184.  
 thermo-electric properties of, A., 1207.  
 electrodeposition of, A., 1097.  
 electrochemical oxidation of, in potash solutions, A., 1097.  
 diffusion of, in tungsten, A., 221.  
 films, crystal structure of, A., 796.  
 manufacture of eyelets of, (P.), B., 989.  
 in aquatic plants, A., 976.  
**Molybdenum alloys** with chromium and tungsten, (P.), B., 68.  
 with cobalt, treatment of, (P.), B., 472.

- Molybdenum alloys**, with cobalt and iron, A., 801.  
with nickel, hardening of, (P.), B., 609.  
with tantalum and chromium, manufacture of, (P.), B., 989.  
with thorium of high emissivity, (P.), B., 191.
- Molybdenum compounds**, calculation of constants of, A., 11.
- Molybdenum carbide**, alloys containing, (P.), B., 731.  
*trioxide*, production of, (P.), B., 547.  
recovery of, from molybdenite, (P.), B., 981.  
*sesquisulphide*, A., 708.
- Molybdic acid**, complex formation in solutions of, A., 228.
- Molybdates**, effect of, on rotatory power of xylose, A., 1190.
- Permolybdates**, red, A., 484.
- Molybdenum organic compounds** :—  
**Molybdenum carbonyl**, production of, (P.), B., 422, 600.  
cyanides, complex, A., 1100.  
*octacyanides*, photolysis of, A., 1214.
- Molybdenum detection and determination** :—  
detection of, microchemically, A., 1104.  
detection and determination of, in steel, A., 590.  
determination of, as ammonium phosphomolybdate, A., 34.  
use of  $\alpha$ -benzoinoxime in, A., 1104.  
colorimetrically, A., 244.  
with potassium permanganate, A., 591.  
volumetrically, A., 356, 1224.
- Molybdenum blue**, formation of, A., 825.
- Molybdenum bronze**, A., 236.
- Molybdenum ores**, removal of phosphorus from, (P.), B., 847.
- Molybdenum wire**, coating of, with beryllium, (P.), B., 557.
- Monarda fistulosa***, inorganic constituents of, A., 205.
- Monarda fistulosa* and *punctata***, juice of leaves of, A., 976.
- Monascin**, A., 280.
- Monascus purpureus***, colouring matter from, A., 280.
- Monazite from Portland, Conn.**, A., 595.  
from Transbaikalia, X-ray spectra of, A., 1015.
- Monel metal**, brazing of steel and, (P.), B., 683.  
use of, in dyeing and bleaching plant, B., 639.
- Monkeys**, rickets in, A., 783.  
yellow fever in, A., 768.
- Mono-chromator**, curved-crystal, for X-ray photography, A., 902.  
double, A., 668.  
quartz, A., 827.  
quartz double, A., 1013.
- Monosaccharides**, Raman spectra of, A., 559.  
glucoside formation in, A., 500.  
configurations and inter-relations of, A., 722.
- Mont Pelée**, fumaroles from, A., 1015.
- Montanyl alcohol**, derivatives of, A., 975.
- Montmorillonite**, in fuller's earth and bentonite, A., 1228.
- Moonfish oil**, A., 636.
- Moonlight**, hydrolysis in green plants by, A., 973.
- Moorlands**, effects of burning on, B., 37.
- Moosberry juice**, vitamins in, B., 784.
- Mordanting**, compositions for, (P.), B., 769.
- Mordenite**, A., 1228.
- Morphine**, extraction and determination of, B., 1104.  
action of, on enzymes, A., 1167.  
on respiration, A., 540.  
and its derivatives, pharmacology of, A., 965.  
toxicology of, A., 774.  
poisoning. See under Poisoning.  
detection of, with potassium ferricyanide, in codeine, etc., B., 960.  
determination of, and its solubility in various solvents, B., 48.  
in its mixtures with acetylsalicylic acid, B., 623.  
in medicinal preparations, B., 287.  
in opium, B., 160, 161, 576, 656.
- Morphine series**, syntheses in, A., 174, 175, 290, 527.
- Mortar**, production of, (P.), B., 106.  
apparatus for, (P.), B., 345.  
colouring of, (P.), B., 800.  
resistance to compression, density, and water-cement ratio of, B., 308.  
decomposition of, B., 937.  
action of sulphate solutions on, B., 642.  
production of moulded articles from, (P.), B., 308.  
waterproof materials for, (P.), B., 425.  
cement, manufacture of, (P.), B., 106.  
strength of, B., 307.  
influence of water-cement ratio on, B., 148.  
light, (P.), B., 263.  
lime, effect of addition of cement on strength of, B., 229.  
lime-sand, formation of calcium silicate in, B., 307.  
containing litharge and glycerol, B., 1081.  
silica, thermal expansion of, after firing at 950°, 1200°, and 1500°, B., 183.  
determination of cement ratio for, B., 148.  
use of phosphoric acid in analysis of, B., 1031.
- Mosquitoes**, sprays against, B., 578.  
*Anopheles*, Paris-green and other arsenicals for control of, B., 955.
- Moths**, tyrosine in cocoons of, A., 533.  
and their eggs, destruction of, in furs, (P.), B., 439.  
cabbage, control of, with non-arsenical sprays, B., 318.  
clothes, fumigation of, with ethylene dichloride and carbon tetrachloride, B., 578.  
codling, control of, B., 278, 318, 396.  
insecticides for, B., 570.  
efficiency of sprays for, B., 396.  
by spraying in S.W. Michigan, B., 202.  
control of hibernacula of, B., 813.  
baits for, in New Mexico, B., 202.  
nicotine tannate and lead arsenate as poisons for, B., 813.  
oriental fruit, spray materials against, B., 523.  
bait trapping of, in Indiana and Georgia, B., 363.
- Moth-proofing**, compositions for, (P.), B., 338.
- Motors**, air cleaners for, (P.), B., 869.  
gas producers for, (P.), B., 921.  
down-draught gas producers for, (P.), B., 377.  
laboratory, speed regulators for, A., 593.
- Motor fuel**. See under Fuel.
- Motor spirit**, manufacture of, (P.), B., 11, 714.  
refining of, (P.), B., 635.  
with phosphorus pentoxide, B., 710.
- Motor spirit**, stabilisation of, (P.), B., 635.  
evaluation of, B., 1065.  
and its combustion products, toxicity of, B., 632.
- Moulds (biological)**, physiology of, B., 1094.  
growth and sterol content of, A., 545.  
effect of yeast on growth and properties of, A., 653.  
action of volatile substances and gases on growth of, A., 963.  
prevention of growth of, on foods, B., 1052.  
respiration of, A., 1167.  
carbon compounds for growth and respiration of, A., 651.  
fermentation products of, A., 544.  
formation of organic acids by, A., 651.  
action of, on aldoses, A., 545, 1169.  
degradation of aromatic and hydro-aromatic compounds by, A., 882.  
accumulation of citric and oxalic acid in, A., 93.  
conversion of ethyl alcohol by, into citric acid, A., 1065.  
grey. See *Ascophora mucedo*.
- Moulds (foundry)**, production of, (P.), B., 266.  
from porcelain or cast metal, (P.), B., 343.  
for metals, paste for, (P.), B., 1123.  
linings for, (P.), B., 726.  
for casting metals, (P.), B., 513.  
sand, for metal casting, facing compositions for, (P.), B., 389.
- Moulded articles**, manufacture of, (P.), B., 5, 345, 392, 998.  
from fibre pulp, (P.), B., 1075.  
from synthetic resins, (P.), B., 779, 1043.  
coating of, with metals, (P.), B., 272.  
with metal inserts, production of, (P.), B., 32, 437.  
compositions, manufacture of, (P.), B., 949, 998.  
materials, manufacture of, (P.), B., 998.
- Moulding compositions**, (P.), B., 119, 727.  
manufacture of, (P.), B., 949.  
from leather scrap, (P.), B., 1092.  
materials, (P.), B., 235, 236.  
manufacture of, (P.), B., 688.  
from carbon, (P.), B., 1092.  
from pentosans, (P.), B., 16.  
from scrap canvas, etc., (P.), B., 779.  
determination of plasticity of, B., 806.  
synthetic resin, electrical properties of, B., 154.  
containing urea-formaldehyde condensation products, (P.), B., 32.
- Mountain ash**, chemistry of bark of, A., 663.
- Mounting media**, refractive indices of, A., 1225.
- Mucic acid**, action of phosphorus pentachloride on, A., 833.  
synthesis of *D*-galacturonic acid from, A., 367.
- Mucin**, physiological preparation from, (P.), B., 704.  
synovial, properties of, A., 294.
- cis-cis*-Muconic acid**, formation of, in oxidation of phenol with peracetic acid, A., 610.  
oxidation of, A., 1234.
- Muconic acid**,  $\alpha$ -hydroxy-, acetyl and benzoyl derivatives, diethyl esters, A., 721.
- Muconic acids**, chloro-, A., 833.
- Mud**, pond, determination of dissolved oxygen in, A., 359.

- Mulberry leaves, concentration of cell-sap of, A., 977.  
toxic substance in, damaged by tobacco, A., 666.
- Mullen, colouring matter of flowers of, A., 501, 931.
- Mullite, B., 887.  
use of iron compounds as mineralisers in preparation of, from kaolinite, B., 23.
- Munjistin, synthesis of, A., 617.
- Musa fibres, manufacture of cellulose from, (P.), B., 499.
- Muscle, specific function and metabolism of, A., 1160.  
constituents of, in hibernation, A., 772.  
swelling of, in rest and after work, A., 298.  
dehydrogenation in, A., 542.  
contraction of, without lactic acid formation, A., 298.  
fission of lactacidogen in, A., 188.  
potassium, phosphate, and lactic acid in contraction of, A., 1160.  
effect of denervation on sympathomimetic action of, A., 190.  
nutritive value of, in growth and reproduction, A., 1161.  
change of reaction of, A., 643.  
 $\alpha$ -oxidation of fatty acids in, A., 1058.  
post-mortal formation of ammonia in, A., 422.  
ammonia and pyrophosphate formation in, A., 875.  
carbohydrates of, A., 77.  
relation between carbohydrate and creatine metabolism in, A., 83.  
production of glycogen in, A., 771.  
by bile acids, A., 644.  
from lactic acid, A., 420.  
action of adrenaline on glycogen of, A., 779.  
relation of creatinuria to glycogen in, A., 83.  
effect of iodoacetic acid on glycolysis in, A., 704.  
influence of adrenaline and insulin on hexosephosphate content of, A., 199.  
effect of adrenaline on lactic acid in, A., 885.  
effect of bromoacetic acid on oxygen consumption by, A., 1285.  
phosphatase of, A., 967.  
effect of arsenates on phosphorylation by, A., 1065.  
effect of  $p_H$  on phosphorylation and lactic acid formation in, A., 1064.  
potassium and chronaxie in degeneration of, A., 642.  
effect of activity of, on condition of proteins, A., 1059.  
origin of pyruvic acid in, A., 875.  
combination of water in, A., 1159.  
chemistry of, in adrenalectomy, A., 638.  
treatment of progressive atrophy of, with glycine, A., 422.  
cardiac, hydrogen donor from, A., 1062.  
nature of respiratory co-enzyme of, A., 775.  
cells, isolation of cell nuclei from, A., 957.  
denervated, formation of glycogen in, A., 298.  
fatigued, influence of sympathetics on biochemistry of, A., 1059.  
frog's, contraction of, by ammonia, A., 771.  
combined creatine in, A., 1153.  
effect of synthalin on formation of lactic acid in, A., 540.
- Muscle, frog's, elimination of purines in, A., 1059.  
gastrocnemius, lactacidogen content in fatigue of, A., 188.  
determination in, of ammonia, A., 78.  
haddock's, carbohydrates and lactic acid in, after death, A., 645.  
human, uric acid and purine-nitrogen in, A., 78.  
mammalian, anserine in, A., 532.  
carbohydrate changes during anaërobiosis of, A., 644.  
hexosephosphate content of, A., 1292.  
living, carbon dioxide dissociation in, A., 420.  
rectus abdominis, of frogs, action of acetylcholine on, A., 190.  
skeletal, heat production of, in arrested formation of lactic acid, A., 188.  
striated, phosphorus distribution in, A., 87.  
plasma-protein of, A., 415.  
determination in, of cholesterol and its esters, A., 765.  
of hexosephosphate, A., 199.  
of lactic acid, A., 532, 875.  
of nucleotides, A., 1273.
- Muscle extracts, energy changes and exchange of phosphoric esters in, A., 1281.
- Muscle juice, denaturation of proteins of, by freezing, A., 1153.
- Muscovite, hydrothermal synthesis of, A., 583.
- Muscular dystrophy in rabbits, muscle creatine in, A., 1057.
- Muscular exercise, metabolism during, in cold-blooded animal, A., 537.  
effect of acidosis and alkalosis on, A., 537.  
effect of carbohydrate on blood-sugar and -phosphorus during, A., 771.  
lactacidogen in, A., 645.  
recovery process after, A., 537.  
possibility of formation of defence enzymes after, A., 193.
- Mushrooms, culture of, (P.), B., 745.  
rates of decomposition of composted manures and spent soils from, B., 1047.  
nutrition of, B., 907.  
cultivated, nutrition of, B., 1002.  
edible, ergosterol content of, A., 437.
- Musk, artificial, manufacture of, (P.), B., 528.
- Mussels, pharmacology of poison of, A., 1163.
- Musts, radioactivity of, B., 859.  
sweet, evaluation of, B., 1051.  
determination of acidity of, B., 911.  
influence of sulphur dioxide and carbon dioxide on determination of total acid in, B., 620.  
determination in, of tartaric acid, B., 1133.
- Mustard gas. See Diethyl sulphide,  $\beta\beta'$ -dichloro-.
- Mustard oils, sulphonation of, (P.), B., 1040.  
determination of, B., 527.
- Mutton, frozen, changes in fat of, B., 45.
- Mycobacterium, effect of ergosterol on growth of species of, A., 883.
- Mycobacterium lacticola, transformation of acetylene by, A., 1169.
- Mycobacterium lepra, action of organic acids on, A., 883.
- Mylabris pustulata, oil from. See Cantharis oil.
- Myocarditis, experimental, heart muscle in, A., 873.
- Myoglobin, crystalline, A., 1054.
- Myristic acid, acid potassium salt, A., 1018.  
sodium salt, conductivity of solutions of, A., 1086.  
*p*-iodophenacyl ester, A., 744.
- Myristicin derivatives, synthesis of, A., 611.
- Myristodipalmittins, A., 931.
- Myrosin, A., 776.
- Myxœdema, gastric secretion in, A., 641.
- Myxoprotein suspensions, flocculation of, by electrolytes, A., 996.
- N.
- Naphtha, production of, from hydrocarbon oils, (P.), B., 589.  
solvent, removal of naphthalene from, (P.), B., 10.  
removal of, from adsorbents, (P.), B., 10.
- Naphthacarbazoles, hydroxy-, manufacture of, (P.), B., 672.
- Naphthacarbazolecarboxylic acids, hydroxy-, manufacture of, (P.), B., 592.
- $\beta$ -Naphthafurancarboxylic acid, A., 1038.
- 4-Naphthaldehyde, 1-hydroxy-, bromination and nitration of, and its derivatives, A., 1031.
- $\beta$ -Naphthaldoxime, A., 743.
- Naphthalene nucleus, structure of, A., 899.  
displacement of atoms and groups in, A., 1031.  
absorption spectrum of, A., 674.  
heat of combustion of, A., 23, 229.  
and 1-nitro-, incomplete combustion of, B., 715.  
hydrogenation of, A., 730; B., 172.  
catalytic hydrogenation of, A., 152.  
electrochemical nitration of, A., 261.  
electrochemical oxidation of, A., 1005.  
sulphonation of, B., 378, 670.  
molecular compound of, with 4:6-dichloro-1:3-dinitrobenzene, A., 259.  
derivatives, Raman spectra of, A., 1076.  
influence of substitution in, on magnetic rotation and birefringence, A., 561.  
hydrogenated, Raman spectra of, A., 7.  
lactones, partly hydrogenated, A., 64.  
removal of, from gases, (P.), B., 377.  
from fuel gas, (P.), B., 668, 791.  
from solvent naphtha, (P.), B., 10.  
determination of, in tetralin solution, B., 760.
- Naphthalene, 2:6-diamino-, dibenzoyl derivative, A., 839.  
1-chloro-, preparation of, by chlorination of naphthalene, A., 941.  
polychloro-derivatives, manufacture of, (P.), B., 57.  
1:7-dihydroxy-, manufacture of, (P.), B., 494.  
iodonitro-derivatives, A., 152.  
1-nitro-, chlorination of, and tetrachloronitro-, A., 1241.  
2-nitro-, melting point of, B., 1070.  
dinitro-derivatives, separation of, A., 1123.
- Naphthalenes, manufacture of thioindoxyl derivatives of, (P.), B., 833.
- Naphthalenes, perisubstituted, reactivity of, A., 268.
- Naphthalene group, ketones of, A., 1250.
- Naphthalene series, replacement reactions in, with diazonium and acetoxymercuri-groups, A., 1050.
- 3-Naphthaleneazo-2:4-dihydroxyquinolines, A., 623.

- 1-Naphthaleneazo-*m*-tolueneazobenzene-*m*-trimethylammonium sulphite, 2-hydroxy-, A., 609.
- Naphthalene-1:4-dicarboxylic acid, preparation of, and its barium salt, A., 512.
- Naphthalene-1:8-dicarboxylic acid, 5-amino-, sulphonyl derivative, anhydride of, A., 839.
- Naphthalenedisulphonic acids, salts of, A., 1124.
- 3-Naphthalenehomophthalimides, A., 624.
- $\alpha$ -2-Naphthalenesulphonamido- $\beta$ -*di*hydroxy-*n*-butyrolactone, A., 936.
- Naphthalenesulphonic acids, arylamine salts of, A., 1124.
- 1:4:5:8-Naphthalenetetracarboxylic acid, and its derivatives, (P.), B., 332, 496.
- Naphthalene-3:6:8-trisulphonic acid, 1-nitro-, salts of, A., 263.
- Naphthalic acid, 1-methyl hydrogen and methyl esters, rotation of, A., 678.
- Naphthalic anhydride, 4-amino-, 4-bromo-, 4-nitro-, and 4-nitroso-3-hydroxy-, and 3:4-*di*hydroxy- and their derivatives, A., 270.
- 3-hydroxy-, transformations of, and 4-amino-, 4-bromo-, 4-nitro-, and 4-nitroso-3-hydroxy-, and 3:4-*di*hydroxy-, and their derivatives, A., 512.
- 1:8-Naphthalimides, *N*-substituted, manufacture of, (P.), B., 14.
- $\beta$ -Naphthamide, 3-amino-, acetyl derivative, A., 840.
- 3-Naphthamide, 1:2-*di*hydroxy-, A., 1129.
- Naphthanilides, 1-hydroxy-, and 2-hydroxy-1-thio-, A., 511.
- 3-Naphthanilide-4-sulphonic acid, 1:2-*di*hydroxy-, A., 1129.
- 1':4'-*endo*Naphtha-2':3':2:3-phenanthrene- $\alpha$ -succinic anhydride, A., 1024.
- 1':3'-Naphtha-3:4-pyrene-5:9:10-trione, A., 747.
- 1':3'-Naphtha-3:4-pyren-5-one, A., 747.
- 1':3'-Naphtha-3:4-pyren-5-one-10-carboxylic acid, and its methyl ester, A., 747.
- $\beta$ -Naphthapyrones, constitution of, A., 751.
- 1:2- $\beta$ -Naphthapyrone, 3-nitro-, A., 1038.
- 1:2- $\beta$ -Naphthapyrones, stability of coumarinic acids derived from, A., 1038.
- 1:2- $\beta$ -Naphthapyrone-3-acetic acid, and its methyl ester, A., 519, 751.
- $\alpha$ -Naphthapyronearsinic acid, A., 761.
- 1:2- $\alpha$ -Naphthapyrone-6-azosulpho- $\alpha$ -naphthylarsinic acid, A., 1268.
- $\alpha$ -Naphthaquinone, 2-hydroxy-, complex salts of, A., 1035.
- Naphthaquinones, reaction of diazomethane and its derivatives with, A., 170.
- Naphthaquinoneaminonaphthoic acid, A., 951.
- $\alpha$ -Naphthaquinone-*d*-camphorsulphone, A., 947.
- 1:4-Naphthaquinone-3-carboxylanilide, 2-hydroxy, and its 4-anil, A., 1129.
- Naphthazarin, nickel salt of, A., 1035.
- Naphthenamine, A., 149.
- Naphthenic acid, salts, production of, with aluminium, rare-earth and acid-earth metals, (P.), B., 1115.
- with heavy and alkaline-earth metals, (P.), B., 592.
- Naphthenic acids, formation of, B., 300.
- salts, applications of, B., 927.
- removal of, from hydrocarbon oils, (P.), B., 539.
- from petroleum, A., 1262.
- detection of, by Charitschkoff reaction, B., 760.
- Naphthenyl bromide, A., 717.
- lin*-Naphthindazole-4:9-hydroquinone, A., 170.
- Naphthindole, 2-bromothio-, A., 280.
- Naphthindoles, thio-, formation of, A., 64, 280.
- Naphthochrome-blue, triacetylmercuri-derivatives, A., 410.
- Naphthoic acetic anhydrides, A., 1129.
- 1-Naphthoic acid, 8-nitro-, displacement of nitro-group in, and 8-bromo- and its derivatives, A., 268.
- 2-Naphthoic acid, 4-amino-3-hydroxy-, acetyl derivative, derivatives of, A., 743.
- 4:8-*di*bromo-3-hydroxy-, manufacture of, (P.), B., 1072.
- 1-hydroxy-, sodium salt, cryptotoxic properties of, A., 779.
- 3-hydroxy-, manufacture of derivatives of, (P.), B., 494.
- iodohydroxy-derivatives, A., 410.
- thio-, and its salts, A., 1246.
- Naphthoic acids, bromination and nitration of, A., 1031.
- 3-acetamidophenyl esters, A., 52.
- Naphthoic benzoic anhydrides, A., 1129.
- $\alpha$ -Naphthol, preparation of, by dehydrogenation of  $\alpha$ -ketotetrahydronaphthalene, A., 266.
- 2-benzoyl derivative, A., 946.
- $\beta$ -Naphthol, production of, by alkali fusion, B., 1113.
- utilisation of tar from, B., 670.
- condensation of, with *p*-chlorobenzaldehyde, A., 279.
- with ethyl alkylacetoacetates, A., 1257.
- coumarins from, A., 858.
- preparation of derivatives of, A., 379.
- o*-bisazo-dyes from, A., 264.
- $\beta$ -Naphthol, 3-amino-, and its derivatives, manufacture of, (P.), B., 1115.
- 3:3'-*di*bromo-, 1-sulphide, A., 379.
- 3-iodo-, A., 840.
- 1-nitroso-, action of sodium hydrogen sulphite on derivatives of, A., 1129.
- hydrogen sulphite compound of, A., 842.
- determination of cobalt by, A., 1224.
- $\alpha$ - and  $\beta$ -Naphthols, dielectric constants of, A., 560.
- reaction of, with hexamethylenetetramine, A., 266.
- compounds of, with styphnic acid, A., 942.
- molecular compounds of, with 4:6-dichloro-1:3-dinitrobenzene, A., 259.
- rate of exhaustion of dyeing baths of, B., 721.
- $\alpha$ - and  $\beta$ -Naphthols, nitroso-, and their derivatives, dipole moments of, A., 677.
- Naphthol AS dyes, luminescence of, in ultra-violet light, B., 98.
- from 1- and 2-aminoanthraquinones, B., 174.
- $\alpha$ -Naphthol-4-aldehyde, 2:4-dinitrophenyl ether of, A., 513.
- 7:2'-Naphthol-1'-azo-2-benzylfluorene, A., 733.
- $\beta$ -Naphtholazodiphenylmethylpyrazole, A., 69.
- $\beta$ -Naphthol-3:8-dicarboxylic acid, A., 1130.
- $\beta$ -Naphthol-1-sulphone, rearrangement of, A., 156.
- $\beta$ -Naphthol-1-sulphonic acid, reaction of diazosulphonates from, A., 284, 404, 755.
- 2':3'-Naphtho-2:3-phenanthrene, A., 1123.
- 2':3'-Naphthophenanthrene-*endo*-1':4'- $\alpha$ -succinic anhydrides, A., 1123.
- [4:5-(Naphtho-1':2')-pyrazole(3)]- $\alpha$ -cinamic acid, A., 524.
- $\beta\beta'$ -Naphthopyrazolone, A., 847.
- 2:3:1:8-Naphthoquinoline, A., 1041.
- $\alpha\beta$ -Naphthoquinoxaline-3-acetic acid, ethyl ester, A., 952.
- peri*-Naphtho-*m*-thiazines, synthesis of, A., 176.
- $\psi$ -1:8-*iso*Naphthoxazone, A., 865.
- $\psi$ -1:8-*iso*Naphthoxazone, 3-amino- and 3-nitro-, A., 1268.
- $\psi$ -1:8-*iso*Naphthoxazone-3-arsinic acid, A., 1268.
- $\beta$ -Naphthoxyacetophenone, A., 1140.
- $\alpha$ -2-Naphthoxymethylmandelonitrile, A., 1140.
- $\alpha$ -Naphthylbenzoic acid, formation of 1:2-benzanthraquinone by dehydration of, A., 1252.
- condensation of methyl derivatives of, A., 1136.
- $\alpha$ -Naphthylbenzoic acid, *mono*- and *di*-bromo-, -chloro-, and -nitro-derivatives, A., 1030.
- $\beta$ -1-Naphthylisobutyric acid, A., 608.
- 2-Naphthylcarbinol, and its hydrate, A., 852.
- 2-Naphthylcarbonyl acetate, and its derivatives, and bromo-, A., 852.
- $\alpha$ -Naphthoyldiphenylcarbinol, A., 737.
- $\beta$ -Naphthoyldihydrazine, and its acetyl derivative, A., 847.
- $\beta$ -Naphthoyldihydrazine, 3-iodo-, A., 840.
- $\alpha$ -Naphthyl esters, Fries rearrangement of, A., 1251.
- methyl sulphide, 4-bromo-, A., 842.
- $\beta$ -Naphthyl methyl ether, and thio-, reaction of, with *o*-phthaloyl chloride, A., 842.
- $\alpha$ - and  $\beta$ -Naphthyl di- and tri-phenylmethyl sulphides, A., 1027.
- N*-Naphthyl-3-acetyl-5-phenyl-2-methylpyrroles, A., 1263.
- trans*-1-Naphthylacrylic acid,  $\beta$ -2-hydroxy-, A., 1038.
- dl*- $\alpha$ -Naphthylalanine, fat of, in the body, and its derivatives, A., 86.
- s*- $\alpha$ -Naphthylalkylthiocarbamides, melting points of, A., 1046.
- $\alpha$ -Naphthylamine, sulphonation of, B., 1070.
- $\alpha$ -Naphthylamine, iodonitro-derivatives, A., 152.
- 4:5-dinitro-, acetyl derivative, A., 1032.
- 8-thiol-, chlorostannate and nitrobenzoyl derivatives, A., 176.
- $\beta$ -Naphthylamine, preparation of, from  $\beta$ -naphthol, B., 12.
- $\beta$ -Naphthylamine, 3-iodo-, and its acetyl derivative, A., 840.
- Naphthylamines, molecular compounds of, with 4:6-dichloro-1:3-dinitrobenzene, A., 259.
- derivatives, nitration of, A., 1025.
- methyl derivatives, preparation of, A., 51.
- $\beta$ -Naphthylamine-4:6:8-trisulphonic acid, trypanocidal action of derivatives of, A., 840.
- $\beta$ -Naphthylaminoazodiphenylmethylpyrazole, A., 169.
- Naphthylarsinic acids, amino-, and their derivatives, and nitro-, isomeric, A., 409.
- Bz*-3- $\alpha$ -Naphthylbenzanthrone, A., 731.
- N*-Naphthyl-4-benzylidenhomophthalimide, A., 624.
- 2-Naphthyl benzyl ketone, 1-hydroxy-, A., 1251.
- $\beta$ -Naphthylcarbamic acid, esters of, and their nitro-derivatives, A., 1025.
- $\beta$ -Naphthylchloroantimonic acid, ammonium salt, A., 866.

- cis*-1-Naphthylcrotonic acid,  $\alpha$ -chloro- $\beta$ -2-hydroxy-,  $\beta$ -2-hydroxy-, and  $\beta$ -nitro-2-hydroxy-, A., 1038.
- $\alpha$ -Naphthylidimethylamine, dye derivative of, with diazotised sulphanilic acid, A., 51.
- N*-Naphthyl-4-*p*-dimethylaminobenzylidenomorphthalimide, A., 624.
- $\beta$ -Naphthyl *p*-diphenyl ketone, and its oxime, A., 853.
- $\alpha$ -Naphthyl *p*-diphenyl ketoxime, A., 853.
- 1:5-Naphthylenebisaminomethylene-camphors, A., 276.
- 1:4-Naphthylenebisiminocamphor, optical properties of, A., 214.
- 1:5-Naphthylenebisimino- $\alpha$ -camphors, A., 276.
- 1:4-Naphthylenedistibinic acid, A., 866.
- N*- $\beta$ -Naphthyl-*N'*-ethylcarbamide, and *N'*-nitro-*N*-1:6:8-trinitro-, A., 1025.
- $\beta$ -Naphthylfurfurylamine, and its hydrochloride, A., 279.
- 2-Naphthylglyoxal, and its derivatives, A., 852.
- N*-Naphthylhomomorphthalimides, A., 624.
- 1-Naphthylhydrazine, 4-bromo-, A., 1039.
- $\alpha$ -Naphthylidenediketohydrindenedi-indone, A., 1252.
- 5-Naphthyliminocamphors, 1-amino-, and their acetyl derivatives, A., 276.
- trans*-1-Naphthylitaconic acid,  $\beta$ -2-hydroxy-, A., 1038.
- trans*-1-Naphthyl- $\alpha$ -methylacrylic acid,  $\beta$ -2-hydroxy-, and its methyl ester, A., 1038.
- 1-Naphthylmethylamine, 4:8-dinitro-, A., 1032.
- $\gamma$ -Naphthyl- $\alpha$ -methylbutyric acids, A., 608.
- 1-1'-Naphthylmethyl- $\Delta^1$ -cyclohexene, A., 1121.
- $\beta$ -1-Naphthyl- $\beta$ -methylitaconic acid, 2-hydroxy-, A., 519, 1038.
- $\beta$ -Naphthyl  $\beta$ -phenylstyryl ketone, anil of, A., 260.
- Naphthyl propyl ketones, 1-hydroxy-, A., 1251.
- $\beta$ -Naphthylstibinic acid, A., 866.
- $\beta$ -Naphthylstibinous oxide, A., 866.
- $\beta$ -Naphthyltetrazole, 5-thiol-, A., 405.
- 1-Naphthyltetrazoles, 5-amino-, A., 1044.
- Narceine, A., 866.
- Narcissus, effect of hot-water treatment on stored bulbs of, A., 549.
- control of basal rot of, B., 907.
- Narcissus tazetta*, carbohydrates in bulbs in, A., 1177.
- Narcosis, theory of, A., 539.
- effect of, on blood-lactic acid, A., 191.
- avertin, A., 878.
- Narcotics, lethal dose of, A., 878.
- percutaneous resorption of, A., 1285.
- effect of, on blood-catalase, A., 1162.
- on blood-coagulation, A., 1273.
- on dehydrogenation by brain tissue, A., 1286.
- on ammonia production and oxygen consumption of brain, A., 424.
- on oxidation by brain, A., 1284.
- on sugar-excretion threshold, A., 191.
- detection of, B., 817.
- Narcotine, isolation of, from vegetables, A., 311.
- demethylation of, A., 1267.
- in relation to vitamin-C, A., 1069, 1294.
- and its derivatives as antiscorbutics, A., 310.
- from orange juice, relation of, to vitamin-C, A., 783.
- determination of, in presence of other alkaloids, A., 289.
- Narsarsukite, A., 595.
- Natrolite, crystal structure of, A., 12, 987.
- vicinal faces on, A., 450.
- Natural substances, biogenesis of, A., 1046.
- Neatsfoot oil, manufacture of substitutes for, (P.), B., 1090.
- determination of "cold-test" figure for, B., 116.
- Nebulæ, spectra of, A., 552.
- intensity of lines in, A., 1072.
- Neem oil, bitter principle of, A., 517.
- Nematic substances, geometric optics of, A., 561.
- Nematodes, control of, with chloropicrin, B., 813.
- Neodorm, activity of novonal, veronal, and, A., 301.
- Neodymium, crystal structure of, A., 1192.
- Neodymium nitrate, thermal decomposition of, in carbon dioxide, A., 132.
- sulphate, magnetic susceptibility of, A., 448.
- Neon, isotopes of, A., 554, 790.
- separation of, A., 1186.
- refraction and dispersion of, A., 323.
- spectrum of, A., 103.
- as wave-length standard, A., 979.
- spectrum of mixtures of helium and, A., 103.
- second spark spectrum of, A., 979.
- superconductivity of, A., 905.
- discharge from, and its spectra, A., 315.
- absorption in discharge tubes of, with traces of hydrogen, A., 1071.
- discharge potential of, in mercury vapour, B., 1073.
- jumping negative glow in, A., 1.
- Doppler effect in canal rays in, A., 4.
- ionisation of, A., 1184, 1185.
- effect of, on ionisation of argon by resonance radiation, A., 1184.
- mobility of positive alkali ions in, A., 670.
- magnetic rotation of, A., 448.
- Neoplastic diseases, blood chemistry of, A., 536.
- Nepheline-sodalite-syenites, in Northern Rhodesia, A., 829.
- Nephritis, acidosis of, A., 297.
- calcium and phosphorus metabolism in, A., 419.
- calcium and phosphorus in blood and cerebrospinal fluid in, A., 874.
- non-glucose reducing substance in blood in, A., 960.
- proteins in, A., 642.
- acid-base equilibrium in serum in, A., 1279.
- eclamptic, acidosis in, A., 1280.
- oedematous, effect of excess of calcium and potassium on, A., 962.
- salyrgan, treatment of, with sarsaparilla extract, A., 774.
- Nephrotic syndrome, plasma-proteins and oedema in children with, A., 419.
- Nereis limbata*, oxygen consumption by, in fertilisation, A., 82.
- Neriin, physiological action of, A., 541, 879.
- Nerium oleander*, physiological action of glucosides of, A., 541, 879.
- Nerves, inorganic ions in, A., 765.
- living, action of direct current on, A., 877.
- stimulated, sugar metabolism of, A., 770.
- sympathetic, metabolism of, A., 770.
- Nervon, crystal growth of, A., 1154.
- Nervous system, colloid chemistry of, A., 191, 878, 1061.
- central, action of metallic salts on, A., 541.
- Nervus accelerans*, stimulation of, A., 539.
- Netoric acid, hydroxy-, A., 855.
- Neuritis and beriberi, A., 767.
- Neurokeratin, basic amino-acids from, A., 293.
- Neutral red as oxidation-reduction indicator, A., 472.
- Neutral salt effect in ionic reactions, A., 818.
- Neutrons, A., 1186.
- existence of, A., 443, 556, 790.
- theory of, A., 672.
- model of, A., 1073.
- evidence for, A., 895.
- distinction between  $\gamma$ -rays and, A., 1187.
- concentration of, in the atmosphere, A., 895.
- mass defect and binding energy of, A., 981.
- passage of, through matter, A., 443; 556.
- scattering, absorption, and ionisation of, A., 672.
- interaction of, with electrons, A., 790.
- collision of, with nitrogen nuclei, A., 790.
- artificial disintegration by, A., 981.
- magnetic, impacts of, with electrons, A., 1184.
- Nickel, recovery of, from speiss, (P.), B., 472.
- and its alloys, treatment of, (P.), B., 1087.
- cementation of, with silicon, B., 1083.
- preferred orientation produced by cold-rolling in sheets of, B., 186.
- and its alloys, apparatus for hot working of, B., 846.
- refractory materials for electric furnaces for melting of, B., 24.
- welding of, B., 553.
- metallurgy of, B., 553.
- in Brazil, B., 681.
- torsion modulus of, at high temperatures, A., 683.
- K* X-ray absorption spectrum of, A., 3.
- Zeeman effect in arc spectrum of, A., 668.
- infra-red arc spectra of, A., 1188.
- bombardment of, by lithium ions, A., 670.
- radiation from, on electronic bombardment, A., 1184.
- secondary electrons from, produced by positive ions of mercury, A., 893.
- anodic behaviour of, A., 1000, 1093.
- contact potential difference between iron and, and photo-electric effect, A., 8.
- electrodeposition of, B., 606.
- on aluminium, B., 430.
- electroplating with, B., 511.
- control of baths for, B., 511.
- low  $p_H$  baths for, B., 991.
- passivity of anodes in baths for, B., 113.
- buffering of solutions for, B., 1085.
- analysis of solutions for, B., 382.
- at low  $p_H$ , B., 1085.
- ultra-rapid electroplating with, in France, B., 846.
- testing of electrolytic deposits of, B., 729.
- thermo-electric power of, and its alloys with copper, A., 987.
- and its alloys, magnetic properties of, A., 795.
- ferromagnetism of, A., 324.
- secondary electron emission in relation to, A., 553.
- ferromagnetism and electrical properties of, A., 449.
- magnetisation curve of, A., 1192.

**Nickel**, resistance and magnetisation of, at the Curie point, A., 452.  
 magnetic multiplets of, A., 1191.  
 magnetostriction of, A., 987.  
 permeability of, in high-frequency electromagnetic fields, A., 216.  
 thermomagnetic effects in, A., 448, 900.  
 thermal diffusivity of, A., 799.  
 adsorption of hydrogen on, A., 568, 688.  
 solubility of, in mercury, A., 330.  
 equilibrium of iron, phosphorus, and, A., 221.  
 rate of corrosion of, by aqua regia, A., 234.  
 passivity of, A., 343.  
 "fogging" of, B., 428.  
 removal of iron from solutions containing copper and, (P.), B., 724.  
 carbonised, manufacture of, (P.), B., 352.  
 catalytic, effect of "supports" on activity of, B., 644.  
 decomposition of esters by, A., 478.  
 for hydrogenation, A., 579, 1213.  
 electrolytic, adhesion of, to brass, B., 606.  
 magnetisation of films of, A., 12.  
 metallic and oxidised, recombination of hydrogen ions at, A., 981.  
**Nickel alloys**, A., 1082; B., 986.  
 with carbon, shrinkage of, on solidification, B., 109.  
 with chromium, for electric resistances, B., 986; (P.), B., 112.  
 with interpenetrating lattice, A., 15.  
 with chromium and iron, B., 509.  
 increasing strength of, (P.), B., 231.  
 thermal expansion of, B., 309.  
 cast, tensile properties of, B., 1083.  
 with cobalt and iron, (P.), B., 310.  
 with copper, (P.), B., 350.  
 age-hardening of, (P.), B., 512.  
 diffusion and corrosion of, A., 1195.  
 effect of addition of silicon to, A., 907.  
 with copper and beryllium, B., 1122.  
 with copper and iron, electrodeposition of, from cyanide solution, B., 66.  
 with copper and silicon, A., 907.  
 with copper and tin, thermal expansion of, B., 149.  
 with copper, tin, and silicon, for safety valves, B., 774.  
 with iron, B., 891.  
 deoxidising agents for, (P.), B., 1086.  
 supercooling of, B., 680.  
 welding of, (P.), B., 683.  
 electrodeposition of, (P.), B., 896.  
 magnetic properties of single crystals of, A., 1193.  
 magnetostriction of, A., 13.  
 electrolytic, X-ray analysis of, A., 1196.  
 magnetic, (P.), B., 67, 189, 388, 471, 608, 609, 988.  
 for cores, etc., (P.), B., 683.  
 with iron and copper, (P.), B., 189.  
 with iron and manganese, (P.), B., 1086.  
 with iron and tungsten, hot-hard, B., 644.  
 with manganese, ferromagnetism of, A., 15.  
 with mercury, A., 456.  
 with molybdenum, hardening of, (P.), B., 609.  
 with palladium, for electrical contacts, (P.), B., 847.  
 with tantalum, manufacture of, (P.), B., 989.  
 with tantalum boride, (P.), B., 1037.  
 with tin, hardening of, (P.), B., 431.  
 with zinc, A., 801.

**Nickel compounds**, magnetic susceptibilities of, A., 678.  
 bivalent, magnetic properties of, A., 1191.  
**Nickel salts**, action of hydrazine on aqueous solutions of, A., 240.  
 action of hypophosphite on, A., 134.  
**Nickel carbonate**, production of mixture of kieserite and, for hydrogenation of fats, B., 979.  
 chloride, magnetic properties of, in solution, A., 985.  
 magnetic rotation of, A., 794.  
 equilibrium of, with lithium chloride and water, A., 697.  
 anodic oxidation of, A., 237.  
 chromite, synthesis and structure of, A., 485.  
 fluoberyllates, A., 583.  
 nitrate, solubility of mixed crystals of magnesium nitrate and, A., 1084.  
 hexahydrate, equilibria of, with manganese and zinc nitrate hexahydrates, A., 1198.  
 potassium nitrites, A., 483.  
 oxide, equilibrium of reduction of, by hydrogen, A., 811.  
 dark blue, A., 824.  
 hydrates, A., 585.  
 sulphate, magneton number of, A., 901.  
 equilibrium of, with calcium sulphate and water, A., 913.  
 heptahydrate, paramagnetism of, A., 448.  
 hexahydrate, crystal structure of, A., 986.  
**Nickel organic compounds**, complex, diamagnetic, configuration of, A., 272.  
**Nickel carbonyl**, electric dipole moment of, A., 1077.  
 magnetic rotation dispersion of, A., 1077.  
 reactions of, A., 485.  
 hardening of fats with, B., 777.  
 poisoning. See under Poisoning.  
 carbonyls, and their derivatives, A., 920.  
**Nickel detection**, determination, and separation:—  
 detection of, spectroscopically, A., 1224.  
 determination of, A., 590.  
 colorimetrically, A., 712.  
 electrolytically, A., 712.  
 in presence of cobalt, A., 924.  
 colorimetrically, in alloys, B., 1121.  
 in steel, electrometrically, B., 430.  
 spectroscopically, B., 891.  
 in nickel steel, B., 1121.  
 in organic substances, A., 922.  
 and its separation from cobalt, A., 1012.  
 separation of, from copper, A., 923.  
**Nickel articles**, degassing of, (P.), B., 1087.  
**Nickel ions**, equilibrium of, with cobalt ions, A., 700.  
 bivalent, colorimetric reaction for, A., 182.  
**Nickel mattes**, treatment of, (P.), B., 989.  
**Nickel ores**, smelting of, B., 644.  
 containing silver, in the Kongsberg district, A., 38.  
**Nickel wire**, mechanical properties of, B., 941.  
 internal strain in, as determined by magnetisation curves, B., 801.  
**Nicotine**, composition of, A., 177.  
**Nicotine**, B., 79.  
 in tobacco smoke, A., 1284; B., 703, 1136.  
 production of, from waste tobacco dust, B., 447.

**Nicotine**, and its derivatives, optical properties of, A., 679.  
 electrical properties of, A., 699.  
 oxidation of, electrochemically, A., 758.  
 removal of, from tobacco, B., 527; (P.), B., 322.  
 from tobacco smoke, B., 48, 79, 287, 576.  
 from tobacco smoke during smoking, B., 206; (P.), B., 207.  
 pure, effect of ultra-violet light on toxicity of, A., 540.  
 action of, against *Aphis rumicis*, B., 39.  
 determination of, B., 48, 287, 750.  
 microchemically, in presence of pyridine and its derivatives, A., 176.  
 in tobacco, A., 975.  
 in unfermented tobacco, B., 750.  
 in tobacco smoke, B., 912.  
*neo*Nicotine, identity of, with anabasine, A., 287.  
**Nicotinonitrile**, trichloro-, A., 526.  
 $\alpha\beta$ -Nicotinylene-2:1-benzimidazole, A., 864.  
**Nicotinophenylhydrazide**, A., 862.  
**Nicotic acid**, and its trimethyl ester, A., 950.  
**Niemann-Pick disease**, degeneration of brain, liver and spleen in, A., 1279.  
**Niobates** and **Niobic acid**. See under **Niobium**.  
**Niobium**, structure of, A., 895.  
 crystal structure of, A., 1192.  
**Niobium salts**, polarographic studies with, A., 1093.  
**Niobium oxide**, production of, from its ores, (P.), B., 103.  
**Niobic acid**, A., 999.  
 dehydration of, A., 707.  
**Niobates**, crystal structure of, A., 1192.  
**Niobium organic compounds**:—  
 Niobates, complex, A., 484.  
**Niobium determination**:—  
 analysis of, A., 36, 356, 591, 1012.  
 determination of, by cathode-ray method, A., 356.  
**Niobotartaric acid**, A., 366.  
**"Nipagin"** sterilisation and preservation by, B., 321.  
 and its mixtures with "nipasol," bactericidal properties of, B., 576.  
**"Nipasol"** sterilisation and preservation by, B., 321.  
 and its mixtures with "nipagin," bactericidal properties of, B., 576.  
*iso*Nipecotinic acid. See **Piperidine-4-carboxylic acid**.  
**Nitella**, toxicity of sodium chlorate to, A., 438.  
**Nitrates**. See under **Nitrogen**.  
**Nitration**, in presence of mercury salts, A., 51.  
**Nitric acid**. See under **Nitrogen**.  
**Nitrides**, superconductivity of, A., 565.  
 magnetism of, A., 10.  
 heat of formation of, A., 470, 998.  
**Nitriles**, alkylation of, in liquid ammonia, A., 606.  
 aliphatic, reactions of, A., 727.  
 aromatic, dipole moments of, A., 677.  
 ethylenic, A., 257, 258.  
 tertiary, manufacture of, (P.), B., 1071.  
 unsaturated, hydrogenation of, (P.), B., 671.  
 identification of, A., 854.  
*iso*Nitriles, dipole moments of, A., 677.  
**Nitrites**. See under **Nitrogen**.  
**Nitro-aldehydes**, aromatic, photochemistry of, A., 1007.  
**Nitroamines**, A., 154, 155.

Nitro-compounds, optical and chemical changes of, and their isomerism, A., 159.  
 reduction of, catalysts for, A., 819.  
   by aldehydes, in ethyl-alcoholic potassium hydroxide, A., 506.  
   by living cells, A., 298.  
 removal of, from acids, (P.), B., 340.  
 aliphatic, action of phenylhydrazine and of thiocarbamide on, A., 362.  
 aromatic, manufacture of, (P.), B., 1072.  
 reduction of, A., 575.  
 colour reactions of, with alkalis, A., 41.  
**Nitrogen**, atomic weight of, A., 115.  
 valency of, in organic compounds, A., 327.  
 atomic disintegration in, A., 980.  
 nucleus, potential barrier of, A., 894.  
 collision of neutrons with, A., 790.  
 isotopes of, A., 980.  
 production of, (P.), B., 102.  
 apparatus for, B., 769.  
 from air, (P.), B., 146.  
 production of mixtures of hydrogen and, (P.), B., 1029.  
 from ammonia, (P.), B., 1029.  
 from bituminous fuels, (P.), B., 103.  
 spectrum of, A., 1183.  
 quadruplets in spectra of oxygen, sulphur, chlorine, and, A., 315.  
 arc spectrum of, A., 103.  
 band spectrum of, A., 207, 667, 891, 1071.  
 energy loss by medium velocity electrons in, A., 106.  
 ionisation of, A., 1185.  
 by electron impact, A., 3, 321.  
 residual ionisation in, at high pressures, A., 3.  
 breakdown potential of, A., 1073.  
 dielectric constant of, A., 793.  
   at high pressures, A., 110.  
 b.p. of, A., 905.  
 dissociation of, A., 1183.  
 heat of dissociation of, A., 799, 913, 1187.  
 solid, luminescence of, A., 1189.  
   X-ray structure of, A., 796.  
 solid and gaseous, phosphorescence of, A., 557.  
 absorption of, by benzene solutions of rubber in sunlight, A., 222.  
 solubility of, in iron, A., 918.  
   in water, A., 990.  
 action of, on calcium carbide, A., 817.  
 fixation of, by *Azotobacter*, A., 1169.  
   by bacteria, A., 306.  
   in the electric discharge, A., 820.  
   by *Leguminosae*, A., 883.  
 liberation of, by soil bacteria, A., 196.  
 life of animals in mixtures of oxygen and, A., 72.  
 active, A., 318, 448.  
   reaction of, with ammonia, A., 820.  
   reaction of hydrogen atoms and, at metallic surfaces, A., 129.  
 residual, determination of, A., 438, 635, 786.  
   by direct nesslerisation, A., 1182.  
**Nitrogen compounds**, superfluous isomerides in, A., 524.  
 mineralisation of, in soils, B., 1096.  
**Nitrogen trichloride**, photosensitised decomposition of, A., 349.  
 reaction of, with nitrogen tetroxide, A., 1218.  
*monoxide (nitrous oxide)*, molecular structure of, A., 680, 794, 902.  
 relaxation of vibrational energy of, A., 1080.  
 absorption spectrum of, A., 1187.  
 infra-red spectrum and molecular configuration of, A., 108.

**Nitrogen monoxide**, Raman spectrum of, A., 897.  
 heat of formation of, A., 913.  
 density and deviation from Avogadro's law of, A., 115.  
 dissociation of, A., 474.  
 adsorption and decomposition of, on charcoal, A., 1199.  
 adsorption of, by glass, A., 1084.  
 entropy of, A., 1205.  
 decomposition of, by cathode rays, A., 29.  
   by mercury vapour, A., 1214.  
   on glowing platinum, A., 819.  
 catalytic decomposition of, by halogens, A., 917.  
   with mixed catalysts, A., 689.  
 thermal decomposition of, A., 345.  
 reaction of, with hydrogen, with platinum catalyst, A., 1213.  
 application of, for production of narcosis, B., 286.  
 analyses of, supplied in cylinders, B., 547.  
 determination of purity of, B., 598.  
*dioxide (nitric oxide)*, photosynthesis of, A., 480.  
 production of, in the electric arc, A., 130.  
 band spectrum of, A., 891.  
 quenching of mercury radiation by, A., 325.  
 ionisation of, by electron impact, A., 321.  
 magnetic susceptibility of, A., 985.  
 and its mixtures with nitrogen, viscosity of, A., 14.  
 surface tension and density of, A., 449.  
 salts of, with sulphurous acid, A., 919.  
 detection of, by ferrous sulphate, A., 1221.  
*dioxide and peroxide*, equilibrium between, A., 468.  
*per- or tetra-oxide*, absorption spectrum of, A., 1187.  
 dissociation of, A., 474, 1209.  
 velocity of dissociation of, A., 916.  
 adsorption of, by colloidal silicic acid, A., 803.  
 hydrolysis of, by potassium hydroxide, A., 31.  
 reaction of, with nitrogen trichloride, A., 1218.  
 excited, life of, A., 1076.  
 determination of, A., 354.  
 oxides, production of, in gas appliances, B., 52.  
   recovery of, from nitrosyl chloride, (P.), B., 507.  
   in manufacture of sulphuric acid, (P.), B., 770.  
   reaction of, with selenium and its dioxide, A., 1100.  
   removal of, from gases, (P.), B., 1119.  
   detection of, in sulphuric acid, by Molisch's test, B., 419.  
 sulphide, band spectrum of, A., 673.  
 tetrasulphide, crystal structure of, A., 797.  
**Nitric acid**, synthesis of, B., 840, 1027.  
   by Fauser's process, B., 1118.  
   manufacture of, (P.), B., 181, 227.  
   from ammonia, B., 100, 381; (P.), B., 145, 260, 420, 933.  
   from nitrous fumes, apparatus for, (P.), B., 131.  
   building construction in works for, B., 424.  
   alloys for plant for, B., 1077.  
   use of chromium-plated bolts in, B., 419.

**Nitrogen**:—  
**Nitric acid**, concentration of, (P.), B., 933.  
 apparatus for, (P.), B., 504.  
   in Valentinier installations, B., 100.  
 effect of dilution on Raman spectra of, A., 7.  
 conductivity of, A., 575.  
 molecular volume of, A., 1190.  
 freezing points of mixtures of oleum and, B., 1077.  
 solubilities and viscosities of mixtures of iodic acid, water, and, A., 568.  
 as oxidising agent, A., 702.  
 analysis of, A., 587.  
 detection of, as fuchsin, A., 1102.  
 determination of, in plant tissues, A., 1178.  
**Nitrates**, ultra-violet absorption spectra of, A., 673.  
 Raman effect in solutions of, A., 897, 1075.  
 decomposition of, A., 351.  
 reduction of, by bacteria, A., 429.  
 effect of carbon monoxide on biological reduction of, A., 969.  
 commercial, nitrites in, B., 933.  
 detection of, removal of bromides and iodides for, A., 242.  
   by diphenylbenzidine, A., 1221.  
   by the ring test, A., 242.  
 determination of, colorimetrically, A., 921.  
   volumetrically, A., 487.  
   by Grandval and Lajoux's method, A., 487.  
   by dropping mercury cathode, A., 1221.  
   with titanous chloride and alizarin, A., 1010.  
   correction for nitrites in, A., 242.  
   in the sea, A., 710.  
   in soils, B., 477.  
 determination in, of chlorates, B., 840.  
**Nitrate ions**, equivalent conductance of, A., 914.  
 normal vibrations of, A., 107.  
**Nitrous acid**, use of, as nitrating agent, A., 842.  
**Nitrites**, decomposition of, A., 351.  
 kinetics of oxidation of, with hydrogen peroxide, A., 233.  
 reduction of, to hydroxylamine, A., 483.  
 organism forming, A., 778.  
 complex, A., 483.  
 detection of, by diphenylbenzidine, A., 1221.  
 determination of, potentiometrically, A., 487.  
   by dropping mercury cathode, A., 1221.  
**Nitrogen organic compounds**, manufacture of, (P.), B., 173.  
 dipole moments of, A., 677.  
 heterocyclic, "dien"-syntheses of, A., 1144.  
 insecticidal action of, B., 401.  
 polycyclic, manufacture of, (P.), B., 221.  
**Nitrates**, organic, NO<sub>3</sub> frequency in, A., 792.  
 stabilisation of, (P.), B., 671.  
**Nitrogen determination**:—  
 determination of, A., 410.  
   by Kjeldahl's method, B., 598.  
   selenium catalyst for, A., 1221.  
   using selenium oxychloride as catalyst, B., 621.  
   addition of saturated alkali in, A., 1105.  
   by Kjeldahl and Dumas methods, A., 1051.



## Nitrogen determination:—

- determination of, with hypobromite, A., 314.  
 microchemically, A., 418.  
 by micro-Dumas method, A., 34, 291, 1149.  
 by Parnas and Wagner micro-Kjeldahl method, distillation apparatus for, A., 411.  
 in calcium cyanamide, B., 545.  
 in coal, B., 326.  
 using selenium catalyst, B., 630.  
 in coal and coke, B., 708, 823, 870.  
 in coal gas, etc., B., 488.  
 in gases, A., 34.  
 in inert gases, by molten lithium, A., 1221.  
 in mixed gases, A., 488.  
 in incombustible inorganic substances, A., 584.  
 in organic compounds and biological fluids, A., 978.  
 in soils, B., 692, 743.  
 in white sugar, B., 279.  
 in tissue extracts, A., 102.  
 in yeast, B., 203, 746.
- Nitrometer, A., 925.
- Nitroprussides, permanent solution of, for acetone tests, A., 978.
- Nitrosates, A., 943.
- Nitrosites, A., 943.
- p*-Nitrosoamino-compounds, aromatic, manufacture of, (P.), B., 95.
- Nitrosobacillus thermophilus*, A., 778.
- Nitroso-compounds, A., 602.  
 dipole moments of, A., 984.  
 aromatic, association of, in solution, A., 120.
- Nitroso-groups, orienting power of, A., 506, 1121.
- Nitroso-ketones, preparation and reduction of, A., 602.
- Nitrosyl chloride, equilibrium of, with methyl alcohol, methyl nitrite and hydrogen chloride, A., 808.  
 hydrolysis of, by potassium hydroxide, A., 31.  
 fluoride, A., 1194.
- Nitrous acid. See under Nitrogen.
- Nitryl chloride, preparation of, A., 1218.  
 fluoride, A., 1194.
- n*-Nonacosane, A., 250.
- Nonacosanols, and their acetates, A., 250.
- Nonacosanones, and their oximes, A., 250.
- n*-Nonane, collision areas of, A., 563.  
 isolation of, from a midcontinent petroleum, B., 169.
- Nonane-1:9-diamidine picrate, A., 55.
- Nonane-1:9-dicarboxylic acid chloride, A., 55.
- Noninene, and  $\alpha$ -chloro-, A., 142.
- Nonoic acid, glyceryl ester, A., 1018.  
*p*-halogenophenacyl esters, A., 744.
- 6-Nonylamino-2-methylquinoline, derivatives of, A., 623.
- Nontronite, thermal decomposition of, A., 1009.
- n*-Nonyl bromides, melting points of, A., 1231.  
*p*-nitrophenylurethane, A., 1232.  
 peroxide, hydroxy-, A., 1110.
- Nonylthanol, pharmacology of, A., 647.
- n*-Nonylidenebisdimethyldihydroresorcinol, A., 1235.
- Nopinene, catalytic conversion of, into pinene, (P.), B., 128.
- Norcholoidanic acid, derivatives of, A., 1243.
- Norconessine, and its salts, and dihydroxy-, A., 406.

- apo*Norconessine, and its salts, A., 406.
- Nordictamnol, and its derivatives, A., 289.
- Nordictamnilydenecyanoacetic acid, and its derivatives, A., 289.
- Nor(+)- $\psi$ -ephedrine salts, action of nitrous acid on, and its derivatives, A., 736.
- d*-Nor- $\psi$ -ephedrine, derivatives of, A., 736.
- d*-Nor- $\psi$ -ephedrinoformylhydrazide hydrochloride, A., 736.
- dl*-Noreserethole, synthesis of, and its salts, A., 287.
- dl*-Noresermethole, and its picrolonate, A., 759.
- dl*-Norglaucine, derivatives of, A., 1047.
- Norhomotropine, and its salts, A., 759.
- Norleucine, isolation and identification of, A., 1023.
- Norlupinane, amino-, and hydroxy-, A., 178.
- d*-Norlupinene, and its salts, A., 178.
- Norm, "doctoring" of the, A., 926.
- Normicotine, and its salts and derivatives, A., 177.
- Norphæophorbides, A., 1266.
- Nor-ricinine, and chloro-, and hydroxy-, and their salts, A., 526.
- Northern lights, spectrum of, A., 1187.
- Northupite, crystal structure of, A., 12.  
 and its bromo-derivative, crystal structure of, A., 218.
- Norvaline, detection of, in fission products of proteins, A., 954.
- l*(+)-Norvaline, A., 637.
- Novadrenaline, A., 546.
- Novatophan, colour reactions of, B., 863.
- Novocaine, action of, A., 773, 1061.  
 detection of, A., 632.  
 in presence of larocaine and tutocaine, B., 1136.  
 colorimetrically, in cocaine, etc., B., 785.
- determination of, B., 576, 1104.  
 iodometrically, A., 72.
- Novonal, activity of veronal, neodorm, and, A., 301.
- Nucleic acid, hydrolysis of, A., 870.  
 mitogenetic radiation from, A., 544.  
 compounds of, with proteins, A., 1089.  
 digestion of, by intestinal juice, A., 1287.  
 pus-, enzymic hydrolysis of, A., 1064.
- Nucleins, influence of bile acids on digestion of, A., 1287.
- Nucleophosphatase, A., 776.
- Nucleosides, hydrolysis of, A., 870.
- Nucleotidase, fission of thymus-nucleic acid by, A., 776.  
 intestinal, A., 777.
- Nucleotides, hydrolysis of, A., 870.  
 determination of, in blood and muscle, A., 1273.
- Nutrition, acid-base balance in, A., 190.  
 fatty acids essential for, A., 961.  
 heat production in relation to, A., 1058.  
 effect of ultra-violet light on, A., 1159.  
 with mixtures of amino-acids, A., 83.  
 human, carbohydrates in, A., 538.
- Nux vomica*, brucine-strychnine ratio in, A., 1178.

## O.

- Oaks, degradation of soil by, A., 1230.  
 discoloration of leaves of, from magnesium deficiency, A., 1296.
- Oak sawdust, retention of alkaloids by, B., 1103.
- Oats, growth of, B., 696.  
 ecology of, B., 953.  
 influence of fertilisers on fixation of carbon dioxide by, B., 953.

- Oats, production of crude protein, fat, and husk in, B., 277.  
 control of smut in, with dusts and formaldehyde, B., 954.  
 feeding of pigs with, B., 959.  
 wild, relation between carbohydrates and growth in, A., 1180.  
 yellow and white, comparison of, B., 282.
- Oat grains, formation of crude protein, crude fat, and husk in, B., 158.
- Oatmeal, effect of, on hæmoglobin regeneration, A., 868.
- Obesity, respiratory quotient in, A., 1158.
- Obsidian, Armenian, use of, in glass, B., 422.
- Obsidianite in the Philippine Islands, A., 1015.
- Obtusatic acid, constitution of, and its methyl ester, dimethyl ether, A., 613.
- Ochronosis of cattle, A., 81.
- s*-Octa-acetyl-*d*-diglucosylcarbamide, A., 1021.
- Octa-acetylsarcosine amide cellobioside, A., 605.
- n*-Octacosane, A., 250.
- Octadecane, equilibrium of, with hexadecane, A., 468.
- Octadecane,  $\alpha\kappa$ -dibromo- and  $\alpha\kappa$ -dichloro-, A., 1109.
- Octadecanol,  $\kappa$ -chloro-, A., 1109.
- Octadecyl iodide, equilibrium of, with hexadecyl iodide, A., 468.
- Octadecylammonium chloride, rotating and fixed forms of, A., 987.
- Octadienoic acids, A., 365.
- Octahydrochrysene, and its picrate, A., 730.
- Octahydro-2:3:8:9-dibenzocoronene-*Bz*2-*Bz*2'-dicarboxylic acid, A., 732.
- Octahydrohemicytisylenes, A., 1147.
- Octahydroindolizine picrate, A., 1145.
- $\Delta^2$ -*trans*-Octahydronaphthalene-2-acetic acid, derivatives of, A., 1032.
- $\Delta^2$ -Octahydronaphthalene-2- $\alpha$ -propionic acid, and its derivatives, A., 1033.
- $\Delta^2$ -*trans*-Octahydronaphthyl-2-acetone, and its derivatives, A., 1033.
- trans*-Octahydronaphthyl-2-*trans*- $\beta$ -decalone, and its derivatives, A., 1032.
- Octahydroperylene, A., 507.
- Octahydropyridocoline-1-carboxylic acid, derivatives of, A., 178.
- $\beta$ -1-Octahydropyridocolyglycidic acid, ethyl ester, A., 178.
- Octahydroquinolizine, and its picrate, A., 1145.
- $\alpha$ -Octahydroretene-carboxylic acid, A., 1029.
- 2:3:4:6:2':3':4':6'-Octamethoxychalkone, A., 388.
- Octamethylenediamine, acetyl derivative, A., 252.
- n*-Octane, collision areas of, A., 563.  
 Raman spectrum of, A., 676.
- n*-Octane,  $\beta$ -chloro-, dextrorotatory, formation of, from *d*- $\beta$ -octyl chloroformate, A., 251.
- iso*Octane. See  $\beta\beta\beta$ -Trimethylpentane.
- d*- $\beta$ -Octanol, action of phosphorus chlorides and oxychloride on, A., 251.
- Octanols, Raman spectra of, A., 793.
- cycloOctanone, derivatives of, A., 58.
- cycloOctanone,  $\alpha$ -chloro-, A., 1042.
- n*-Octatrienol, A., 496.
- Octene, pure, preparation of, A., 830.
- $\Delta^4$ -Octinene,  $\alpha$ -chloro-, A., 142.
- Octodistearins, A., 364.
- Octoic acid, acid potassium salt, A., 1018.  
*p*-chlorophenacyl ester, A., 744.  
*p*-tolyl ester, manufacture of, (P.), B., 1137.

- Octopus, extractives of muscle of, A., 294.  
 6-Octoylamino-2-methylquinoline, derivatives of, A., 623.  
 Octyl alcohols, liquid, viscosity and molecular arrangement of, A., 14.  
*cyclo*Octylacetic acid, and its ethyl ester, A., 58.  
*β-cyclo*Octylethyl alcohol, A., 58.  
*cyclo*Octylformaldehyde, and its semicarbazone, A., 58.  
*n-Octylidenebisdimethyldihydroresorcinol*, A., 1235.  
*β-Octylmalonic acid*, ethyl ester, A., 720.  
*N-2-cyclo*Octylpiperazine, *N-2-hydroxy-*, and its salts, A., 1042.  
 1-*n-Octylpiperidine*, and its salts, A., 48.  
*Odontria zealandica*, insecticides for, B., 908.  
 Odour and constitution, A., 1019.  
   "clarity" of, A., 539.  
 Œdema produced by plasma-protein depletion, A., 1158.  
   nephritic, serum-proteins in, A., 642.  
   nephrotic, A., 1279.  
   nutritional, A., 642.  
 Œstrin, A., 1253.  
   and its derivatives, A., 655.  
   properties and bio-assay of, A., 971.  
   standard of reference for, A., 971.  
   derivatives, surface films of, A., 1173.  
   mucification of vaginal epithelium by, A., 433.  
   in butterflies, A., 433.  
   rat and mouse units for, A., 200.  
 Œstrin, *tri*hydroxy-, ring structure of, and its derivatives, A., 1253.  
 Œstrous cycle in rats on manganese-free diet, A., 1283.  
 Oils, purification of, (P.), B., 485.  
   filters for, (P.), B., 629.  
   bleaching materials for, (P.), B., 422.  
   heat transmission to, in pipes, B., 403.  
   conductivity of, at low temperatures, A., 676.  
   for use with cutting tools, (P.), B., 220.  
   for use in spinning of textiles, B., 560.  
 Oils, drying, treatment of, (P.), B., 517.  
   effect of heat treatment on properties of, B., 193.  
   swelling of films of, B., 612.  
   effect of carbon dioxide in boiling of, B., 806.  
   oxidation of, B., 994.  
   oxidation and polymerisation of, B., 900.  
   polymerisation of, (P.), B., 435.  
   production of waterproof coating materials from, (P.), B., 807.  
   compositions containing, (P.), B., 31, 997.  
   oxidised, relation between colour and chemical constitution of, B., 1125.  
   S-D-O, use of, for corrosion-resistant coatings, B., 649.  
   synthetic, manufacture of, (P.), B., 435.  
 Oils, essential, theory of photosynthesis of, A., 61.  
   apparatus for production of, B., 527.  
   recovery of, from *Citrus* fruits, (P.), B., 449.  
   properties of, B., 400, 448.  
   heat absorption by, A., 914; B., 1055.  
   characterisation of, by capillarity, A., 803.  
   Brazilian, B., 161.  
   of Central France, B., 863.  
   examination of, B., 287.  
   with the analytical quartz lamp, B., 448.  
 Oils, essential, analysis of, B., 864.  
   detection of, by the vanillin-hydrochloric acid reaction, B., 368.  
   detection in, of benzyl alcohol in presence of ethyl and methyl alcohols, B., 703.  
   determination of, in drugs and spices, B., 1137.  
   in spices, B., 80.  
   determination in, of aldehydes and ketones, B., 368, 960.  
   of cincole, B., 161.  
 Oils, essential. See also :—  
   *Asarum* oil.  
   *Asarum seoulensis*.  
   *Bystropogon mollis*.  
   Camphor oil.  
   Cassia oil.  
   *Chrysanthamnus nauseosus*.  
   Citronella oil.  
   *Eryngium foetidum*.  
   Eucalyptus oil.  
   Geranium oil.  
   Grape seed oil.  
   Hyacinth.  
   *Hydnocarpus*.  
   Lavender oil.  
   Lemon oil.  
   Lemongrass oil.  
   *Leptospermum*.  
   Orange oil.  
   Peppermint oil.  
   *Pinus longifolia*.  
   Rose oil.  
   Rue oil.  
   *Sciadopitys verticillata*.  
   Spear-mint oil.  
   Star-aniseed oil.  
   *Strophanthus*.  
   *Suim latifolium*.  
   *Wintera colorata*.  
 Oils, fatty, report of International Commission on, B., 69.  
   report of Pan-European Commission No. 4 on, B., 69.  
   production of, from animal tissues, (P.), B., 1126.  
   from fish, etc., rotary boilers for, (P.), B., 946.  
   extraction of, (P.), B., 435.  
   from ground-nut sludge, (P.), B., 435.  
   from seeds, nuts, etc., (P.), B., 947.  
   from seeds, sewage, etc., (P.), B., 996.  
   from vegetable materials, (P.), B., 152.  
   from whales, fish, etc., (P.), B., 560.  
   rotary extractor for, (P.), B., 85.  
   expression of, B., 354.  
   from seeds, etc., (P.), B., 233, 736.  
   recovery of, from emulsions, etc., (P.), B., 649.  
   from spent fuller's earth, (P.), B., 736.  
   from whale blubber, etc., (P.), B., 474.  
   purification of, (P.), B., 435, 946.  
   refining of, (P.), B., 649.  
   apparatus for, (P.), B., 1039.  
   deacidification of, with glycerin, B., 776.  
   desulphurisation of, (P.), B., 233.  
   removal of solid oils and waxes from, (P.), B., 777.  
   bleaching of, (P.), B., 806, 947.  
   theory of, B., 899.  
   Russian bleaching clays for, B., 560.  
   preservation of, (P.), B., 649, 1090.  
   thickening of, by heating, (P.), B., 517.  
   Buchner funnel for, B., 152.  
   relation between properties of, and emulsifying power of emulsifiers, B., 269.  
   ultra-violet absorption spectra of, B., 1126.  
 Oils, fatty, influence of silicic acid on heats of combustion of, A., 342.  
   and their fatty acids, relation of freezing point and melting point of, B., 193.  
   determination of viscosity of, B., 946.  
   rancidity of, in relation to methylene-blue reduction, B., 516.  
   prevention of, (P.), B., 736.  
   inhibition of rancidity of compositions of, (P.), B., 233.  
   hardening of, negative catalysts in, B., 313.  
   nickel losses in, B., 995.  
   influence of, on their natural secondary ingredients, B., 435.  
   influence of organic dyes on hydrogenation of, B., 313.  
   catalytic hydrogenation of, B., 29.  
   effect of conditions on, A., 1018.  
   at high temperatures and pressures with copper-nickel catalyst, B., 30.  
   high-pressure hydrogenation of, B., 434.  
   neutralisation of, (P.), B., 492.  
   oxygen absorption of, B., 776.  
   antioxidants of, B., 29, 1124; (P.), B., 460.  
   antioxidant action on, of aniline and its derivatives, B., 29.  
   of diphenylhydrazine and  $\alpha$ -naphthylamine, B., 355.  
   yellowing of, B., 1125.  
   polymerisation of, B., 776, 1126.  
   manufacture of polymerisation products of, (P.), B., 233.  
   isolation of fatty acids of, B., 193.  
   iodine value of solid fatty acids separated from, by Twitchell's method, B., 391.  
   of the Belgian Congo, B., 116.  
   edible, refractive indices of, B., 269.  
   neutralised, washing of, B., 193.  
   oxidisable, drying of, (P.), B., 355.  
   siccative, manufacture of oxidation products of, (P.), B., 233.  
   sulphonated, B., 995.  
   treatment of, (P.), B., 561.  
   emulsive capacity of, and their miscibility with neutral oils, B., 270.  
   determination of fatty matter in, B., 850.  
   volumetric determination in, of sulphur trioxide, B., 1090.  
   thickened, product from, for use in paints, etc., (P.), B., 612.  
   unsaturated, influence of catalysts on absorption of oxygen by, B., 193.  
   production of sulphonated derivatives from, (P.), B., 233.  
   effect of method of production on constants of, B., 994.  
   "aniline-point" of, B., 849.  
   smoke, flash, and fire points of, B., 648.  
   oxygen number of, B., 1089.  
   partial iodine and thiocyanogen values of, B., 515.  
   examination of, with Wood's light, B., 1090.  
   analysis of, B., 354.  
   detection of aldehydes formed by oxidation of, B., 612.  
   potentiometric determination of acidity of, B., 268.  
   determination of "cold-test" figure for, B., 116.  
   determination of hydroxyl number of, B., 849.  
   determination of rancidity of, B., 899.  
   determination in, of glycerol, acidimetrically, B., 686, 850.  
   of unsaponifiable matter, B., 28, 233.

Oils, fatty. See also:—

*Aleurites montana*.  
Alligator oil.  
Arachis oil.  
Bittersweet.  
Calamary oil.  
*Calophyllum inophyllum*.  
Camellia oil.  
Cantharis oil.  
*Carpotroche brasiliensis*.  
Carpotroche oil.  
Castor oil.  
*Clupea ilisha*.  
Cod-liver oil.  
Cottonseed oil.  
*Dipsacus fullonum*.  
Ergot oil.  
Hemp, Canadian.  
Hempseed oil.  
Hong Kong oil.  
*Hydnocarpus*.  
Linseed oil.  
*Linum usitatissimum*.  
Neatsfoot oil.  
Oleo oils.  
Olive oil.  
Olive-kernel oil.  
*Paeonia*.  
Palm oil.  
*Parkia biglandulosa*.  
Peanut oil.  
Perilla oil.  
Po-yoak oil.  
Quince-seed oil.  
Rapeseed oil.  
"Red oil."  
*Rhus succedanea* and *vernificera*.  
Rice oil.  
Rye-germ oil.  
Salmon oil.  
Sea-perch oil.  
Sesamé oil.  
Shark-liver oil.  
Soya-bean oil.  
Spermaceti oil.  
*Sterculia tragacantha*.  
Sunflower-seed oil.  
Talisay oil.  
Tobacco-seed oil.  
Tomato-seed oil.  
Tung oil.  
Wheat-germ oil.  
Wood oil.

Oils, fish. See Fish oils.

fuel. See Fuel, oil.

heavy, use of, in lorry engines, B., 169.

Oils, hydrocarbon, production of, (P.), B., 412.

from carbonaceous materials, (P.), B., 299.

treatment of, (P.), B., 91, 330, 491, 588, 830.

with aluminium chloride, (P.), B., 830.

with metallic halides, (P.), B., 10, 412, 492, 635, 713.

purification of, (P.), B., 10, 91, 458, 459, 635.

"doctor" solutions for, (P.), B., 1019.

refining of, (P.), B., 11\*, 92, 330, 412, 588, 714.

material for, (P.), B., 876.

refining and purification of, (P.), B., 137.

removal from, of corrosive materials, (P.), B., 926.

of hydrogen sulphide, (P.), B., 714.

of naphthenic acids, (P.), B., 539.

of paraffin wax, (P.), B., 669.

of sulphur, (P.), B., 137\*, 412, 714.

of waxes, (P.), B., 669.

Oils, hydrocarbon, decolorisation of, (P.), B., 413.

coking of, (P.), B., 876, 1113.

conversion of, (P.), B., 90, 91, 218, 539, 634, 713, 875, 924, 1018.

apparatus for, (P.), B., 411.

conversion and fractionation of, (P.), B., 588.

cracking of, (P.), B., 90, 136, 218, 411, 491, 539, 587, 634, 668, 712, 713, 830, 876, 1018, 1067, 1068.

apparatus for, (P.), B., 90, 136, 411, 829, 923, 924.

pressure stills for, (P.), B., 218, 713.

control of, (P.), B., 970.

reaction-velocity coefficients of, B., 327.

production of slurry of lime for, (P.), B., 539.

utilisation of carbonaceous residues from, (P.), B., 328.

with simultaneous production of producer gas, (P.), B., 410.

with removal of tar, (P.), B., 876.

adaptation of, to European requirements, B., 168.

destructive hydrogenation of, (P.), B., 249, 299.

distillation of, (P.), B., 330, 588, 635, 876, 925, 1069.

treatment of pressure-distilled products from, (P.), B., 412.

apparatus for distillation or decomposition of, (P.), B., 410.

fractionation of, (P.), B., 91, 588.

apparatus for, (P.), B., 329.

heating of, (P.), B., 217.

hydrogenation of, (P.), B., 875.

vaporisation of, (P.), B., 219.

improvement of electrical insulation of, (P.), B., 559.

action of volcanic ash on, B., 297.

amalgamation of coal and, (P.), B., 457.

production of carbon from, (P.), B., 220.

from coal, oil shale, etc., conversion of, into oils of lower boiling point, (P.), B., 217.

heavy, conversion of, into light oils, (P.), B., 458, 924.

distillation of, (P.), B., 330.

apparatus for distillation and coking of, (P.), B., 218.

distillation and cracking of, (P.), B., 217.

high-boiling, conversion of, (P.), B., 830.

light, production of, from heavier oils, (P.), B., 713.

low-boiling, production of, (P.), B., 411.

from heavier oils, (P.), B., 249.

non-smoky, (P.), B., 220.

sulphurised, production of, (P.), B., 589.

unsaturated, water-soluble sulphonic acid of, as precipitant for proteins, (P.), B., 1069.

determination of sulphur in, B., 327.

Oils, insulating. See Insulating oils.

irradiated, germicidal action of, B., 962, 1138.

lubricating. See Lubricating oils.

Oils, mineral, origin of, A., 1016.

formation of, B., 918.

production of, in Great Britain, B., 6.

extraction of, from shale, etc., (P.), B., 924.

recovery of, from oil sands, (P.), B., 587.

from sludges, (P.), B., 714, 925.

from subterranean strata, (P.), B., 538.

treatment of, (P.), B., 10, 413.

purification of, (P.), B., 92, 588, 635, 714.

revivification of agents for, (P.), B., 11.

Oils, mineral, refining of, (P.), B., 10, 137, 714, 830.

apparatus for, (P.), B., 635.

stills for, (P.), B., 970.

by cold fractionation, B., 216.

utilisation of residues from, B., 969.

recovery of caustic soda from, B., 969.

sulphonic acids from, B., 1112.

filters for, (P.), B., 4.

decolorisation of, by filtration through paper, (P.), B., 669.

decolorisation and hot filtration of, (P.), B., 589.

decolorisation and removal of gum from, B., 826.

dehydration and purification of, (P.), B., 830.

removal from, of phenols, (P.), B., 9.

of salts, (P.), B., 669.

of waxes, (P.), B., 249, 250, 635.

bleaching earths for, B., 969.

cooling of, (P.), B., 458.

cracking of, B., 1064; (P.), B., 90, 491, 587, 634, 712, 875, 923, 970, 1068.

heat problems in, B., 455.

apparatus for, B., 88; (P.), B., 668, 829, 1018.

Vickers coil-furnace for, B., 457.

prevention of corrosion of plant for, B., 584; (P.), B., 1068.

removal of carbonaceous materials from plant for, (P.), B., 11.

Winkler-Koch plant for, B., 1064.

stills for, (P.), B., 970.

suitability of, for cracking, B., 968.

apparatus for cracking and coking of, (P.), B., 491.

distillation of, (P.), B., 491, 971, 1069.

apparatus for, (P.), B., 876, 924.

in Germany, B., 1064.

vacuum distillation of, (P.), B., 588.

distillation and cracking of, (P.), B., 924.

fractionation of, (P.), B., 137.

apparatus for, (P.), B., 539.

hydrogenation of, B., 666; (P.), B., 55.

catalytic high-pressure hydrogenation of, B., 967.

high-pressure stabilisation of, B., 826.

stabilisation and reclamation plant in refineries for, B., 1064.

spectroscopy of ageing of, A., 1075.

specific refraction of, B., 536.

phytosterols and abietic acid as origins of optically active constituents of, B., 247.

and potassium radiation, A., 1108.

specific heats of, B., 247.

variation in melting point of, and effect of "tempering" thereon, B., 135.

determination of volatility of, B., 826.

explosion limits of mixtures of air and vapours of, B., 247.

automatic open Cleveland flash and fire equipment for, B., 585.

protection of, against fire during storage, (P.), B., 589.

oxidation of, B., 297, 666.

electrochemical oxidation of, B., 790.

antioxidant for, (P.), B., 378.

neutralisation of, (P.), B., 492.

sulphonation of, (P.), B., 589.

action of volcanic ash and pumice on, B., 408.

composition from, (P.), B., 831.

preparation of "kontakt" extract from, B., 1065.

extraction of phenols from, B., 968.

fungicidal properties of, B., 39.

use of, in insecticidal dusts, B., 570.

for quenching of steel, (P.), B., 589.

- Oils, mineral, from coal, B., 216, 376.  
 acid containing, working up of residues from distillation of, over alkalis, (P.), B., 93.  
 crude, displacement of, from oil-bearing sands by aqueous solutions, B., 455.  
 treatment of, (P.), B., 1018.  
 reconstruction of old batteries for, B., 1064.  
 of the Benoi district, B., 1064.  
 Grozni mixed-base, preparation of automobile oil "T" and bright stocks from, B., 1065.  
 East Texas, refining of, B., 872.  
 Emba, sulphuric acid treatment of long residuum from, B., 1064.  
 Emba solar, synthetic acids from, B., 168.  
 German, cracking of, B., 584.  
 heavy, gasification of, by partial combustion, (P.), B., 586.  
 light, production of, (P.), B., 925.  
 separation of, from wash oils, (P.), B., 925.  
 from low- and intermediate-temperature carbonisation, analysis of, B., 135.  
 low-viscosity, Russian, B., 666.  
 of the Maikop district, B., 1016.  
 Ragusa, cracking and catalytic hydrogenation of, B., 666.  
 distillation and cracking of, B., 246.  
 hydrogenation of, B., 1015.  
 used, regeneration of, by Korach-Randaccio process, B., 760.  
 viscous, viscosity and resistance to flow of, B., 760.  
 determination of tar value of, by Hungarian M.A.V. method, B., 88.
- Oils, petroleum. See Petroleum oils.  
 sulphonated, B., 648.  
 switch. See Switch oils.  
 vegetable, B., 994.  
 production of, B., 647.  
 adsorption bleaching of, B., 559.  
 decolorisation of, in relation to colouring matter, B., 1126.  
 cracking of, (P.), B., 923.  
 ultra-violet absorption spectra of, B., 1126.  
 effect of silent electric discharge on, B., 850.  
 solubility of, in mixtures of acetone and methyl alcohol, B., 70.  
 hydrolysis of, by castor-seed lipase, A., 1165.  
 fungicidal properties of, B., 39.  
 fuel value of, B., 169.  
 of the Union of S.S.R., B., 30, 390.  
 determination of, in butter, B., 686.
- Oil emulsions. See under Emulsions.  
 Oil fuel. See under Fuel.  
 Oil gas. See under Gas.  
 Oil palms. See Palms, oil.  
 Oil seeds, determination of moisture in, B., 560.  
 Oil wells, treatment of mud flush used in drilling of, (P.), B., 877.  
 cementing of, B., 307.  
 cement for, B., 799.  
 prevention of corrosion in, (P.), B., 669.
- Oilfields of the Santa Monica Mts., California, A., 248.
- Ointments, bakelite jars for, B., 234.  
 pharmacology of, A., 89.  
 determination in, of titanium, B., 1054.
- Okara from soya beans, and its conversion into bile acids, A., 534.
- Oleanonic acids, derivatives of, A., 749.
- Oleander, glucosides of leaves of, A., 436.
- Oleanol, A., 61.
- Oleanolic acid, A., 61.  
 and its derivatives, A., 1140.  
 constitution of, A., 1035.  
 partial hydrogenation of, and its derivatives, A., 749.
- Oleanylene, A., 61.
- Olefines, nuclear synthesis of, A., 361.  
 liquid, production of, (P.), B., 714.  
 treatment of gases containing, (P.), B., 1018.  
 knock ratings of, B., 968.  
 catalytic hydrogenation and polymerisation of, A., 1212.  
 polymerisation of, with diolefines, A., 830.  
 conversion of, into alcohols, (P.), B., 590, 716, 1071.  
 production of additive compounds of, (P.), B., 1071.  
 manufacture of plastic substances of polysulphides and, (P.), B., 119, 236.  
 determination of, by titration with bromine, B., 826.  
 bromine water pipette for, A., 1226.  
 determination of aromatic hydrocarbons and, B., 831.
- $\Delta^4$ -Olefines, synthesis of, A., 40.
- cycloOlefines, thermal reactions of, A., 372.
- Olefinic series, A., 40.
- Olefinic acids, A., 251.  
 reaction of, with hypochlorous acid and ethyl hypochlorite, A., 930.
- Olefinic compounds, reactions of, A., 930.  
 action of, on alcoholic fermentation, A., 1283.
- Oleic acid, autoxidation of, A., 931.  
 reaction of, with hydrazine polysulphide, A., 832.  
 sodium salt, conductivity of solutions of, A., 803.  
 equilibrium of, with phenol and water, A., 994, 1036.  
 with phenol, xylene, and water, A., 335.  
 with sodium chloride and water, A., 1205.  
 methyl ester, selective hydrogenation of mixtures of methyl clupanodonate and, A., 252.  
 influence of lecithin on solubility of, in bile, A., 871.
- Oleic acid, *p*-bromo-, *p*-chloro- and *p*-phenyl-phenacyl esters, A., 946.
- Oleo oils, fatty acids and glycerides in, B., 735.
- Oleodibromostearic acid, constitution of, A., 252.
- Oleomargarine, detection of, in butter, B., 515.
- Oleoresin, production of, from long leaf pine defoliated by fire, B., 436.
- Oleum. See Sulphuric acid, fuming, under Sulphur.
- Oligodynamy of metals, A., 654, 1067.
- Olives, gasification and by-products from husks of, B., 1111.
- Olive oil, manufacture of, (P.), B., 391, 736.  
 hydrogenation of, B., 805.  
 alteration in glyceride structure during, A., 498.  
 lubrication of automobile engines with, B., 163.  
 utilisation of, by fungi, A., 1168.  
 effect of administration of, on phosphatides and cholesterol in, A., 1058.  
 Sanza, detection of, B., 647.  
 Tunisian, refractive indices of, B., 269.  
 Soltsien reaction with, B., 899.
- Olive oil, detection in, of rape oil, B., 648.  
 determination of oil from press-residues in, B., 560.
- Olive trees, grignons as fertilisers for, B., 782.
- Olive-kernel oil, determination of resin acids in, B., 70.
- Olivetol, A., 521.
- Olivetolcarboxylic acid, A., 521.  
 and its derivatives, A., 620.
- Olivetonic acid, derivatives of, A., 521.
- Olivetonic, and its dimethyl ether, A., 521.  
 methyl ether, A., 620.
- Olivetoric acid, A., 521.  
 derivatives of, A., 620.
- Olivillo, Chilean, pulping of wood of, B., 1023.
- Olovine, as a medium for oil varnishes and enamels, B., 806.
- Onions, spraying and dusting of, B., 441.  
 control of thrips in, B., 813.  
 radiation from, A., 775.
- Onium compounds, physiological activity of, A., 608, 622.  
 heterocyclic, A., 622.
- "Onkotic" pressure. See under Osmotic pressure.
- Oolites of Lorraine, A., 360.  
 of Lorraine and Luxemburg, A., 595, 829.
- Opal, structure of, A., 359.  
 crystal structure of, A., 451.  
 cristobalite in, A., 903.
- Opianic acid, potassium salt, reactions of, A., 279.
- Opianylglycollic acid, ethyl ester, and its semicarbazone, A., 279.
- Opianylloxycetone, and its disemicarbazone, A., 279.
- Opisthorchiasis, chronic, action of tartaric acid in, A., 1158.
- Opium, effect of, on blood-sugar, A., 768.  
 determination of morphine in, B., 161, 576, 656.  
 contamination of morphine in its determination by the B.P. method in, B., 160.  
 determination of morphine in preparations of, B., 287.
- Opium bases, configuration of, A., 178.
- Opsopyrrole, porphyrins from, A., 173.
- Opsopyrrolecarboxylic acid, derivatives of, A., 282.
- Optical activity, theory of, A., 9, 448.  
 and absorption spectra, A., 899.  
 antipodes, separation of, by means of co-ordination compounds, A., 930.  
 investigations at high pressure, apparatus for, A., 827.  
 lever, interference, A., 357.
- Optically active compounds, influence of solvents on rotation of, A., 794.  
 solutions of, A., 30.  
 asymmetric transformations in presence of, A., 269.  
 fission of, by enzymes, A., 1166.  
 inorganic, A., 111.
- Optochin, oxidation of, A., 1040.
- Oranges, blood, red colour of, A., 203.
- Orange I, alkylation of, A., 609.
- Orange juice, deterioration of, in relation to its iodine reducing value, B., 1006.  
 preservation of, (P.), B., 1007.  
 by freezing, B., 862.  
 vitamin-C in beverage from, B., 815.
- Orange oil, B., 287.  
 Californian, B., 657.
- Orange peel, removal of bitter taste from, (P.), B., 446.
- Orange-seed meal, solubility of proteins in, in solutions of sodium salts, A., 227.

- Orange water, fluorescence of, B., 368.
- Ores, treatment of, with gases, (P.), B., 894.  
 finely-divided, (P.), B., 3.  
 concentration of, by flotation, B., 386;  
 (P.), B., 231, 311, 556, 730, 847,  
 990, 1123.  
 collectors for, (P.), B., 731.  
 promoter for, (P.), B., 190.  
 reagents for, (P.), B., 388.  
 by magnetic separation, (P.), B., 730.  
 automatic regulation of concentration of  
 slimes of, (P.), B., 244.  
 selective flotation of, (P.), B., 151.  
 separation of, (P.), B., 990.  
 apparatus for washing and separation of,  
 (P.), B., 3.  
 mineral grains in relation to dressing of,  
 B., 509.  
 grading of, (P.), B., 580.  
 grinding apparatus for, (P.), B., 292.  
 reduction of, (P.), B., 942.  
 electric furnaces for, (P.), B., 897.  
 roasting of, (P.), B., 372, 942.  
 furnaces for, (P.), B., 266, 729, 893.  
 apparatus for sintering of, (P.), B., 729.  
 smelting of, (P.), B., 607.  
 in reverberatory furnaces, (P.), B.,  
 802.  
 vertical retorts for, (P.), B., 867.  
 electric smelting of, (P.), B., 512.  
 separation of metals from, (P.), B., 350.  
 selective chlorination of, (P.), B., 896.  
 arsenical, treatment of, (P.), B., 471.  
 Canadian, treatment of, B., 606.  
 gypsum, flotation of, (P.), B., 311.  
 lake, formation of, A., 716.  
 oxidised, froth flotation of, (P.), B., 847.  
 pulverised, separating table for, (P.),  
 B., 1087.  
 sintering of, (P.), B., 554.  
 pyritic, from Spain, A., 1015.  
 of Sadonsk, selective flotation of, B.,  
 431.  
 of south Osetii, A., 1228.  
 sulphide, treatment of, (P.), B., 110, 506,  
 894.  
 flotation concentration of, (P.), B., 151.  
 treatment of gases from heating of,  
 (P.), B., 894.  
 roasting of, B., 469.  
 chloridising roasting of, (P.), B., 556,  
 848\*.  
 sintering of, (P.), B., 729.  
 micro-analysis of, B., 1036.
- Organs, growth of, in relation to calcium-  
 potassium ratio, A., 86.  
 stability of preparations from, B., 128.  
 producing hormones, relations between,  
 A., 780.  
 animal, potentials in, A., 85.  
 perfused, metabolism in, A., 539.
- Organ extracts, depressor action of, A., 414.
- Organic compounds, mesostructure of, A.,  
 512.  
 constitution and ultra-violet absorption  
 spectra of, A., 557.  
 co-ordinative theory of constitution of,  
 A., 830.  
 intramolecular rearrangement in, A.,  
 1016.  
 characterisation of C:C linking in, by  
 bromine-binding number, A., 717.  
 dipole moments of, A., 215.  
 dipole moments and structure of, A., 718.  
 intermolecular forces in, A., 563.  
 relationship between length of chains of  
 thread molecules and specific viscosity  
 of solutions of, A., 361.  
 preparation of, A., 156.  
 heat treatment of, (P.), B., 493.
- Organic compounds, alteration in properties  
 of, by complex formation, A., 718.  
 absorption in ultra-violet and chemical  
 reactivity of, A., 211, 1029.  
 effect of substitution on absorption  
 spectra of, A., 558.  
 dielectric constants of aqueous solutions  
 of, A., 214.  
 electro-chemistry of, A., 1013.  
 magnetism of, A., 16.  
 heat capacity of, A., 698.  
 heats of combustion of mixtures of, A.,  
 1091.  
 adsorbed, relation of angle of contact to  
 constitution of, A., 803.  
 solution of, in non-aqueous solvents, A.,  
 508, 802.  
 solubility of, in rubber, B., 651.  
 incomplete combustion of, in presence of  
 catalysts, B., 715.  
 bromination of, in presence of activated  
 charcoal, A., 606.  
 chlorination of, (P.), B., 792.  
 thermal decomposition of, A., 1108.  
 electricity produced in decomposition of,  
 A., 1000.  
 catalytic dehydration of, (P.), B., 591.  
 fission of, by catalysts, A., 58.  
 hydrogenation of, A., 944.  
 oxidation of, with selenium oxides, (P.),  
 B., 13.  
 reduction of, (P.), B., 172.  
 electrolytic reduction of, A., 1005.  
 electrolytic reduction potentials of, A.,  
 231.  
 sulphurisation of, (P.), B., 1115.  
 reactivity of atoms and groups in, A., 718.  
 reaction of, with hydrogen persulphides,  
 A., 1026.  
 action of sulphur on, A., 940.  
 containing oxygen, separation of, from  
 their solutions in hydrocarbons, (P.),  
 B., 635.  
 containing phenolic groups, metal-  
 ammonium salt complexes of, (P.), B.,  
 128.  
 containing two or more phenyl groups,  
 substitution in, A., 1024.  
 aromatic, analysis of two-component  
 systems of, by means of viscosity and  
 density gradients, A., 941.  
 chain, place of severance in C:C linking  
 in, A., 716.  
 crystalline, packing of, (P.), B., 592.  
 enolic, detection of, by means of mer-  
 curous nitrate, A., 362.  
 heterocyclic, manufacture of, (P.), B.,  
 252.  
 heteropolar, A., 1125, 1127.  
 of high molecular weight, polymorphism  
 of, A., 149, 934.  
 homologous, surface energy and boiling  
 point of, A., 453.  
 liquid, detection of oxygen in, A., 529.  
 long-chain, kinetics of degradation of,  
 A., 576.  
 molecular, A., 153, 841.  
 optically active, ultra-violet absorption  
 spectra of, A., 320.  
 oxidisable, preservation of, (P.), B., 460.  
 paramagnetic, A., 324.  
 polymerised, manufacture of, (P.), B.,  
 878.  
 highly-polymerised, elastic properties of,  
 A., 695.  
 radial, characteristics of, A., 830.  
 identification of, microanalytically, A.,  
 529, 631.  
 wet micro-combustion of, A., 291.  
 detection of, A., 72, 931; B., 1136.
- Organic compounds, determination of, by  
 oxidation with chromate mixture, A.,  
 1269.  
 detection and determination of arsenic  
 in, after perchloric acid treatment, A.,  
 955.  
 determination in, of acetyl groups,  
 microchemically, A., 1051.  
 of boron and fluorine, A., 1269.  
 of bromine, A., 291.  
 of bromine and chlorine, acidimetric-  
 ally, A., 529, 631.  
 by combustion, A., 1149.  
 of carbon, A., 291.  
 of carbon and hydrogen, A., 72, 867,  
 954.  
 of chlorine, A., 410.  
 of halogens, A., 867, 1051.  
 of mercury, halogens or arsenic or  
 sulphur, simultaneously, A., 955.  
 of sulphur, A., 291, 631, 867, 1149.  
 of thiocyno-group, A., 1239.
- Organic matter, preparation of, for analysis,  
 by treatment with perchloric acid, A.,  
 71.
- Organisms, effect of humidity on growth  
 of, A., 964.  
 relation between water content and  
 oxygen consumption in, A., 770.  
 marine, growth response of, to thiol and  
 sulphoxide, A., 646.  
 See also Micro-organisms.
- Ornithine, salts and crystalline form of, A.,  
 150.
- d-Ornithine, derivatives of, A., 624.
- Ornithine-NN'-sulphonic acid, and its  
 potassium salt, A., 1023.
- Orotic acid, formation of, in synthesis of  
 purines, A., 754.  
 alkyl derivatives of, A., 66.
- Orotic acid, 2-thio-, synthesis of, A., 952.
- Orthoform, crystal structure of, A., 326.
- Orthoformic acid, ethyl ester, velocity of  
 hydrolysis of, A., 346.
- trialkyl esters, A., 931.
- Orthopnea, A., 641.
- Oryzanin, and its derivatives from rice  
 polishings, A., 973.  
 crystalline, isolation of, A., 657.
- Osmiridium, A., 1107.
- Osmium, extraction, purification, and  
 determination of atomic weight of,  
 A., 1185.  
 specific heat of, A., 220.
- Osmium tetroxide, vapour pressure, surface  
 tension and density of, A., 116.
- Osmium determination:—  
 determination of, potentiometrically, A.,  
 587.
- Osmosis in binary systems, A., 334, 460.  
 with two membranes, A., 569.  
 of disperse systems, A., 570.  
 in liquids of constant composition, A.,  
 119.  
 in systems of three liquids separated by  
 two membranes, A., 224.  
 abnormal, at non-swelling membranes,  
 A., 570.  
 anomalous, theory of, A., 334.  
 in animal cells, A., 877.  
 negative, A., 334.
- Osmotic coefficients of strong electrolytes,  
 A., 912.
- Osmotic pressure, A., 21, 539.  
 in cells, A., 691.  
 colloid-, A., 301, 540, 763, 764.
- Osteitis deformans, metabolism in, A., 1158.
- Osteomalacia, effect of vigantol on serum-  
 calcium and -phosphorus in, A., 537.
- Osthol, constitution of, A., 751.

- Osthollic acid, and its methyl ester, A., 751.  
*Ostrea gigas*. See Oysters.
- Ostruthin, A., 751.
- Otella ovalifolia*, celluloses of, A., 436.
- Ouahains, A., 856.
- Ovalbumin, coagulation of, A., 807.  
 combination curves, hydrogen-ion regulating power and equivalents of, A., 631.  
 hypersensitiveness of, A., 198.  
 precipitinogenic action of, A., 869.  
 nitrogen balance on diet of, supplemented by fat or carbohydrate, A., 189.  
 crystalline, A., 294.  
 basic amino-acids of, A., 1148.
- Ovary, metabolically-active extracts of, A., 886.  
 effect of removal of, on calcium and potassium of blood, A., 97.
- Ovens, doors for, (P.), B., 87.  
 for firing of pottery, heat treatment of metals, etc., (P.), B., 452.  
 chamber, suction control apparatus for, (P.), B., 250.  
 apparatus for discharging distillation products from, (P.), B., 927.  
 intermittently operated, (P.), B., 536.  
 core, (P.), B., 84.  
 electric, (P.), B., 647.  
 heaters for, (P.), B., 28.  
 evaporating, (P.), B., 131.  
 gas-heated water, A., 1014.  
 rotary, spiral, (P.), B., 1059.
- Overvoltage, A., 700.  
 measurement of, by commutator methods, A., 701.  
 hydrogen, A., 700.  
 at curved electrodes, A., 343.
- Ovoglobulin, hypersensitiveness of, A., 198.
- Oxalic acid, kinetics of oxidation of, by chlorine, A., 702.  
 reaction of, with camphene, A., 1037.  
 with potassium permanganate, A., 1002.  
 production of, from uronic acid by *Aspergillus niger*, A., 195.  
 from *d*-gluconic acid by moulds, A., 1169.  
 accumulation of, by moulds, A., 93.  
 detection of, A., 1233.  
 determination of, refractometrically, A., 632.  
 in tobacco, B., 703.  
 in urine, A., 1156.
- Oxalic acid, salts, reactions of, with bromine, A., 344.  
 with iodine, A., 1210.  
 determination of, volumetrically, using fluorescein, A., 922.  
 metallic salts, deposition potential of, A., 1092.  
 ammonium salt, crystallisation of, from aqueous solutions containing potassium, B., 259.  
 reaction of mercuric chloride and, A., 235.  
 calcium salt, adsorption and peptisation reaction of, A., 355.  
 determination in, of magnesium, A., 243.  
 cerium, lanthanum, neodymium, praseodymium, and samarium salts, thermal decomposition of, in carbon dioxide, A., 132.  
 chromium salt, electrolysis of, A., 236.  
*p*-dimethylaminotriphenylmethylammonium salt, A., 733.  
 ferrous salts, A., 42.  
 manganese salt, heats of formation of, A., 913.  
 potassium salt, production of, from the formate, A., 29.
- Oxalic acid, zinc salt, hydrates, methyl alcoholates, and pyridinates of, A., 1008.
- Oxalic acid,  $\beta$ -amino- $\beta$ -phenylpropionamide and cinnamide esters, A., 1246.  
 ethyl ester, reaction of, with *o*-aminophenols, A., 1244.  
 with phosphorus pentabromide, A., 1233.  
 ethyl isocamyl ester, A., 1018.  
*N*-methyl-*p*-phenylenediamine ester, A., 733.
- sym*-Oxalmalondiphenylene-*pp*-distibinic acid, A., 867.
- Oxaloacetic acid, ethyl ester, magnesium derivative, A., 499.
- Oxalosorbic acid, ethyl ester. See  $\alpha$ -Keto- $\Delta^6$ -hexadiene- $\alpha$ -dicarboxylic acid, diethyl ester.
- Oxamide dioxime, salts of, A., 1236.
- iso*Oxazole, 5-cyano-, A., 1145.
- 5-*iso*Oxazoleamine, and its hydrochloride, A., 286.  
 $\alpha$ -*iso*Oxazoleazoformamidoxime, and its salts and derivatives, A., 1146.  
 $\alpha$ -*iso*Oxazoleazotrinitromethane, A., 1146.  
*iso*Oxazole-5-carboxylazide, A., 1145.  
*iso*Oxazole-5-carboxylhydrazide, A., 1145.  
*iso*Oxazole-5-carboxylic acid, Curtius degradation of, A., 1145.  
*iso*Oxazole-5-urethane, A., 1145.  
5-*iso*Oxazolylazo- $\beta$ -naphthol, A., 286.
- Oxazone dyes, soluble in water, manufacture of, (P.), B., 593.
- Ox-horn, keratin, isolation of methionine from, A., 762.
- Oxidase, determination of, A., 648.
- Oxidation, A., 302, 303.  
 theory of, A., 702.  
 electronic theory of, A., 11.  
 mechanism of, A., 722.  
 reaction chains in, A., 352.  
 ozone as catalyst for, A., 235.  
 induced by sugars, A., 27.  
 biological, A., 1170.  
 in sympathetic tissues, A., 1154.
- Oxidation-reduction, A., 472.  
 autoxidation in, A., 915.  
 organic, reversible, optical study of, A., 947.  
 two-step, A., 809.
- Oxides, A., 468.  
 thermoelectric properties of, A., 1193.  
 thermal dissociation of, A., 228, 573.  
 pyrochemical series of, B., 147.  
 freezing of gels and sols of, A., 466.  
 active, A., 801, 988, 1008, 1211.  
 amphoteric, hydrates of, A., 124, 1204.  
 higher, A., 585.  
 highly-refractory, fusion diagrams of, A., 913.  
 hydrated, osmotic binding of water in, A., 997.  
 sols, coagulation of, A., 994.  
 amphoteric, A., 809.  
 hydrated and active, A., 125, 129, 228.  
 hydroaromatic, manufacture of, (P.), B., 1072.  
 organic dissociable, A., 732.  
 refractory, thermal expansion of, B., 64.  
 chlorination of, (P.), B., 678.  
 extrusion of insulators of, for vacuum tubes, B., 548.  
 corrosion of vessels made of, B., 771.  
 solid, electrical conductivity of, A., 9.
- Oxido-compounds, cyclic, 3- and 6-membered, A., 62.
- Oxido-ketones, reaction of, with Grignard reagents, A., 616.
- Oxidotetradecane, formation of, from tetradecane- $\alpha$ -diol, A., 598.
- Oximes, configuration of, A., 743.  
 constitution of, A., 51.  
 rearrangement of, A., 404.  
 nitration of, A., 271.  
 alicyclic, stereoisomerism of, A., 1133.
- Oximino-esters, acetyl derivatives, reduction of, A., 727.
- Oximino-ketones, A., 157.  
 dissociation of, A., 499.
- Oxindole, condensation of chloro-isatins with, A., 169.
- Oxonine, A., 629.
- Oxonitine, molecular formula of, A., 629.
- Oxyallobetulononic acid, and its methyl ester, A., 750.
- Oxycellulose, and its identity with  $\beta$ -cellulose and celloextrin, A., 604.
- Oryzococcus macrocarpus*, anthocyanin of, A., 203.
- Oxycyanogen, A., 482.
- Oxydimorphine, A., 761.
- Oxygen, valency angle of, A., 984, 1115.  
 electron affinity of, A., 680.  
 isotopes of, A., 980.  
 metastable state of, A., 891.  
 manufacture of, from air, (P.), B., 146.  
 from water, (P.), B., 547.  
 production of hydrogen and, by electrolysis, B., 259.  
 purification of, from electrolysis of water, (P.), B., 261.  
 velocity of sound in, A., 13.  
 quadruplets in spectra of chlorine, nitrogen, sulphur, and, A., 315.  
 absorption band spectrum of, A., 891.  
 mass spectrum of, and its mixtures with helium, A., 894.  
 destruction of photoluminescence of fluorescing systems of, A., 213.  
 solid, X-ray structure of, A., 796.  
 ionisation of, by electron impact, A., 321.  
 heat of adsorption of, on copper and nickel catalysts, A., 332.  
 heat of dissociation of, A., 341, 981.  
 b.p. of, A., 905.  
 molecular volume of, A., 1190.  
 effect of magnetic field on viscosity of, A., 1081.  
 adsorption of, by rubber sheets, A., 991.  
 solubility of, in iron, A., 22, 117.  
 in silver, A., 457.  
 velocity of solution of, in water, A., 26, 345, 1212.  
 determination of tension of, in liquids, A., 102.  
 rise of pressure in combustion of gases with, A., 344.  
 flame temperatures of mixtures of air, methane, and, A., 127.  
 explosion and ignition of mixtures of hydrogen and, A., 576, 701.  
 explosion of, with hydrogen in soap bubbles, A., 815.  
 photosensitised explosion of mixtures of hydrogen and, by chlorine, A., 479.  
 combination of carbon monoxide and, under influence of radon, A., 822.  
 catalytic combination of carbon monoxide and, on platinum, A., 703.  
 photochemical reactions of, with carbon monoxide and hydrogen, A., 918.  
 combination of hydrogen and, on surface of silica, A., 25.  
 reaction of, with graphite, A., 816.  
 with propane, A., 1001.  
 with propylene, A., 815.  
 manufacture of preparations of, for use in respirators, (P.), B., 63.  
 removal of, from steam, (P.), B., 823.

- Oxygen, graphic registration of consumption of, A., 955.  
 chamber for measurement of consumption of, by animals, A., 411.  
 life of animals in mixtures of nitrogen and, A., 72.  
 vacate-, determination of, microchemically, A., 872.
- Oxygen compounds containing sulphur, constitution of, A., 984.
- Oxygen detection and determination :—  
 detection of, in organic liquids, by iodine, A., 529, 762, 954.  
 determination of, by Winkler's method in methylene blue media, A., 353.  
 rates of absorption by absorbents used for, B., 641.  
 in mixed gases, A., 488.  
 apparatus for, B., 770.  
 in steel, B., 1035, 1121.  
 dissolved in water, in presence of organic matter, B., 290.
- Oxyhæmoglobin, reduction of, in living tissues, A., 1270.
- $\epsilon$ -Oxy- $\delta$ -keto-oleanolic acid lactone, A., 1036.
- Oxylupanine, oxidation of, A., 178.
- Oxymethylnestrychnidium salts, A., 407.
- 3-Oxy-2-methyl-1-thionaphthen 1-dioxide, A., 64.
- Oxypeucedanin, and its derivatives, A., 752.
- Oxypeucedanic acid, A., 752.
- N*-Oxyphenylanthranil, 2-chloro-, A., 169.
- Oxyproline, oxidation of, by liver, A., 775.
- Oxyproline-*N*-sulphonic acid, and its potassium salt, A., 1023.
- Oxyproteic acid, excretion of, in urine, A., 416.  
 determination of, in urine, A., 416.
- Oxyneostrychnidine, A., 406.
- 3-Oxy-1-thionaphthen, synthesis of thionaphthindoles from, and its 1-dioxide phenylhydrazones, A., 280.
- Oysters, A., 638.  
 value of, in anæmia, A., 959.  
 superiodised, iodine in, A., 1227.
- Ozokerite, application of deposition test to, B., 247.
- Ozone, distribution of, in the atmosphere, A., 358.  
 density of, in the atmosphere, A., 714.  
 formation of, at high temperatures, A., 708.  
 photochemical formation of, in presence of zinc oxide, A., 130.  
 apparatus for production of, (P.), B., 422, 507, 945, 1029.  
 generators for, (P.), B., 898.  
 electrical generators for, (P.), B., 804\*.  
 high-frequency electrode for, (P.), B., 732.  
 absorption spectrum of, A., 896.  
 ultra-violet absorption spectrum of, A., 6.  
 Raman spectrum and molecular structure of, A., 983.  
 photokinetics of, A., 820.  
 heat of formation of, A., 229.  
 as oxidation catalyst, A., 235, 1095.  
 dissociation and thermal decomposition of, A., 344.  
 effect of hydrogen on thermal decomposition of, desensitised by bromine water, A., 1001.  
 and its mixtures with chlorine, decomposition of, in carbon tetrachloride solution, A., 25.  
 oxidation of benzaldehyde and sodium sulphite by, A., 1212.  
 reaction of, with chlorine, A., 815.  
 effect of light on, A., 348.  
 with heterocyclic compounds, A., 1142.
- Ozone, thermal reaction of, with hydrogen bromide, A., 701.  
 determination of, in ozonised air, B., 383, 546.
- Ozonides, hydrogenation of, catalytically, A., 1113.
- Ozonisers, (P.), B., 192, 1039.  
 high-temperature, experiments with, A., 925.
- P.
- Pachimeters, B., 484.  
 at Rothamsted, B., 371.  
 testing of clays, soils, and flour with, B., 867.
- Packing materials for joints, (P.), B., 1013.  
 heat-insulating, (P.), B., 628.  
 transparent, B., 380.
- Paddy, green manuring of, B., 441.
- Padutin. See Callierein.
- Pæonia*, oils from, B., 390.
- Pæonol, amino-, and 6-bromo-, and their derivatives, and bromo-hydroxy- and -nitro-, and nitro-, A., 1256.
- Pagurus longicarpus*. See Crabs, hermit.
- Paints, (P.), B., 234.  
 manufacture of, (P.), B., 234, 807, 997.  
 on laboratory and works scales, B., 116, 195.  
 use of turbidimeter in, B., 613.  
 from lithopone, (P.), B., 807.  
 drying of, (P.), B., 355.  
 driers for, B., 195.  
 standardisation of, B., 195.  
 effect of light on, B., 356.  
 reflection of light by, B., 900.  
 luminescence of, B., 356.  
 films, investigation of, B., 561.  
 hardness of, B., 195, 613.  
 blistering of, B., 851.  
 "livering" of, B., 947, 1126.  
 physical tests on, B., 1090.  
 durability of, over wood treated to repel termites, B., 194.  
 exposure tests on, B., 271.  
 evaluation of degree of rusting in, B., 271.  
 terminology in, B., 195.  
 weathering tests of, B., 271.  
 accelerated weathering of, B., 195.  
 anti-oxidants and anti-skinning agents for, B., 153.  
 use of aluminium powder and colour bronzes in, B., 947.  
 use of bitumens in, B., 70.  
 formation of "iron soaps" in, B., 900.  
 "critical oil contents" of, B., 194.  
 influence of oil content on oxidation of oil in, B., 355.  
 product from thickened fatty oils for use in, (P.), B., 612.  
 antiseptic value of phenols and chlorinated phenols in, B., 271.  
 optimum pigment content of, B., 356.  
 pigment extenders for, B., 947.  
 mixing of pigments for, (P.), B., 852.  
 relations between pigments and media for, B., 613.  
 pigments and oil in, B., 356.  
 causes of floating pigments in, B., 195.  
 use of synthetic resins in, B., 851.  
 use of slate powder in, B., 270.  
 thinners for, B., 70.  
 prevention of corrosion of metals by, B., 117.  
 spraying apparatus for, (P.), B., 1127.  
 removal of, from metals, (P.), B., 687, 731.  
 composition for, (P.), B., 234.  
 solvents for, (P.), B., 687.
- Paints, hazards in application of, B., 271.  
 aluminium, coating of pipes with, (P.), B., 197.  
 antifouling, (P.), B., 234.  
 summer exposure tests on, B., 153.  
 bitumen-emulsion, manufacture of, (P.), B., 1091.  
 bituminous, manufacture of, (P.), B., 997.  
 brushable, consistency of, B., 355.  
 casein, B., 613.  
 cellulose, adhesion of, to wood, (P.), B., 234.  
 emulsified, (P.), B., 234.  
 emulsion, (P.), B., 807.  
 for floors, lead chromate pigments for, B., 356.  
 house, quick-drying, glycerol phthalate resins in, B., 194.  
 white, accelerated weathering tests on, with different thinners, B., 70.  
 lead, solubility of, in water, B., 996.  
 basic lead sulphate, manufacture of, (P.), B., 31.  
 linseed oil, effect of driers on properties of films of, B., 649.  
 luminous, B., 900.  
 marine, (P.), B., 118.  
 oil, solvents and diluents for, B., 562.  
 properties of, in relation to "critical oil content," B., 1040.  
 viscosity and pigment content of, B., 900.  
 plastic, (P.), B., 517.  
 priming, for wood, B., 194.  
 protective, for iron, B., 31.  
 for metals, B., 728.  
 for railway structures and equipments, B., 313.  
 rust-preventive, (P.), B., 947.  
 durability of, on steel, B., 71.  
 comparative merits of red lead and iron oxide in, B., 561.  
 rust-resistant, production of, (P.), B., 436.  
 protection of edges with, B., 687.  
 for ships, B., 313.  
 silicate, fire-proof, B., 686.  
 for reflecting ultra-violet rays, B., 194.  
 water, anticoagulant for, (P.), B., 997.  
 white, durability and rust-preventive properties of, B., 355.  
 opacity of, B., 391.  
 effect of organic acids on gloss yellowing and settling properties of, B., 152.  
 metal stains on, B., 271.  
 fluorescence analysis of, B., 613.  
 detection in, of nitrocellulose, B., 356.
- Painting, priming of absorbent surfaces prior to, (P.), B., 184.  
 preparation of metals for, (P.), B., 803.  
 spray, of wood, B., 194.
- Painting materials, permanence of, B., 392.
- Palladium, photo-electric and thermionic properties of, A., 208.  
 electrodeposition of, B., 645; (P.), B., 473, 1124.  
 atomic heat and coefficient of expansion of, A., 220.  
 specific heat of, A., 220.  
 kinetics of adsorption of hydrogen by, A., 701.  
 removal of adsorbed hydrogen from, A., 28.  
 occlusion of hydrogen by, A., 687.  
 diffusion of hydrogen through, A., 685, 906.  
 equilibrium of, with hydrogen at 0°, A., 124.



- Palladium alloys for dentures**, (P.), B., 191.  
with gold and silver, crystal structure of, A., 221.  
charged with hydrogen, photo- and thermo-electric effects of, A., 789.  
with iron, A., 221.  
with nickel, for electrical contacts, (P.), B., 347.  
with platinum, "stone test" on, B., 429.  
with platinum and rhodium, A., 221.  
with rhodium, electrodeposition of, (P.), B., 610.  
with silver, effect of adsorbed hydrogen on lattice constant of, A., 16.
- Palladium bases** :—  
**Dichlorodiamminopalladium**, isomerism of, A., 240.  
**Palladodiammines**, isomeric, A., 824.
- Palladium compounds**, chelate, A., 1101.  
**Palladous chloride**, use of, as reagent for purines and alkaloids, A., 1052.
- Pallasite from Alice Springs**, Central Australia, A., 359.
- Palms**, oil, manual treatment of, B., 39.  
varied fruiting ability in, A., 435.
- Palm kernels**, Malayan, B., 390.
- Palm oil**, production of, from West African oil palms, B., 391.  
composition of, B., 850.  
recovery of, from residues, etc., (P.), B., 736.  
bleaching of, B., 390.  
cracking of, B., 919.  
carotene in, A., 203.  
red, vitamin-D in, A., 658.
- Palmitine**, and its salts, A., 177.
- Palmitrubine**, A., 177.
- Palmitic acid**, electro-osmosis through diaphragms of, A., 17.  
interfacial tension between benzene solutions of, and aqueous barium or sodium hydroxide solutions, A., 1200.  
ethyl ester, density, surface tension and parachor of, A., 796.
- Palmitic acid**,  $\beta$ -bromo-,  $\beta$ -hydroxy-, and its acetyl derivative, and  $\beta$ -iodo-, A., 366.  
 $\beta\lambda$ -dihydroxy-, and its derivatives, A., 720.
- Panax ginseng**, A., 878.  
glucoside of, A., 397.
- Panax repens**, sapogenins of, A., 397, 516.
- Panaxsapogenin**, and its derivatives, A., 516.
- Panaxtoxin**, A., 516.
- Pancreas**, effect of, on resorption of fatty acids, A., 308.  
blood-amylase in disease of, A., 81.  
antiglyoxalase of, A., 543.  
preparations from, A., 427.
- Pancreatic extracts**, insulin-free, pharmacology of, A., 96.
- Pancreatic juice**, proteolytic enzymes of, A., 881.  
variations in, during hyperglycæmia, A., 185.  
pure, insulin action of, A., 655.
- Pancreatin**, action of, on gelatin surfaces, A., 1064.  
on raw hide, B., 1000.
- Panicum crusgalli**, lime disintegration of straw of, B., 46.
- Papain**, action of, on urease, A., 92.
- Papaver rhæas**, dye of, A., 934.
- Papaverine**, paralyzing action of, in relation to structure, A., 540.  
production of substitutes for, (P.), B., 1055.
- Papaverine derivatives**, pharmacology of, A., 301, 1163.  
and its derivatives, determination of, potentiometrically, A., 763.
- Papaveroline**, derivatives of, A., 527.
- Paper**, microscopical examination of structure of, B., 837.  
volumetric composition of, B., 177, 1024.  
manufacture of, (P.), B., 18, 225, 502, 543, 796, 882, 930, 1025, 1075, 1116.  
apparatus for, (P.), B., 1075.  
machines for, (P.), B., 720.  
nomograms for use in, B., 674.  
use of chemicals in, B., 1073.  
using coated broke, (P.), B., 462.  
from cornstalks, B., 255.  
corrosion-resistant metals for, B., 1085.  
treatment of fibres for, (P.), B., 1075.  
wood fibres for, B., 15, 177.  
elimination of foam in, (P.), B., 796.  
use of glucose in, B., 837, 1023.  
alloy cast iron for use in, B., 680.  
from oak waste, B., 542.  
use of photo-electric cells in, B., 674.  
production of pitch in, B., 837.  
quality of potato flour for, B., 397.  
reduction of sulphur compounds in, B., 929.  
sorption of water by materials for, B., 141.  
from deciduous wood, B., 416.  
conditioning of, (P.), B., 883.  
drying of, B., 1023; (P.), B., 722.  
determination of porosity of, B., 767.  
refraction of light by, B., 542.  
permeability of, to air, B., 177.  
coating of, with pitch, (P.), B., 544.  
effect of calcium and phosphorus on adhesive strength of casein for, B., 795.  
strength of coatings on, B., 674.  
coating compositions for, (P.), B., 797.  
protective coatings for, (P.), B., 336.  
production of transfer coatings on, (P.), B., 303.  
colouring and decorating of, by spraying, (P.), B., 640.  
creping of, (P.), B., 226.  
dyeing of. See under Dyeing.  
heat- and fire-proofing of, (P.), B., 143.  
impregnation of, (P.), B., 502.  
with rubber, (P.), B., 797.  
impregnation and coating of, (P.), B., 639.  
printing and waxing of, (P.), B., 978.  
sizing of, (P.), B., 502, 882.  
theory of, B., 335.  
by Chinchin method and with size prepared in the cold, B., 542.  
resinous soaps for, (P.), B., 116.  
sizing tests on, B., 96.  
determination of sizing strength of, B., 1116.  
treatment of, with varnishes, etc., (P.), B., 1025.  
waterproofing of, (P.), B., 1025.  
water-resistance of, B., 674, 767.  
rate of moisture regain in, B., 718.  
equilibrium between humidity and moisture in, B., 718.  
testing of strength of, B., 223.  
hygrometry of testing of, B., 674.  
calibration of Elmendorf tearing tester for, B., 674.  
sheet properties and fibre properties of, B., 718, 1074.  
effect of fibre length on properties of sheets and pulp of, B., 1023.  
effect of white water fibre on properties of, B., 837.
- Paper**, determination of stability of, by heating, B., 674, 837.  
reduction of yellowing of, with age, (P.), B., 462.  
deterioration of, by sulphur dioxide, B., 542.  
detection of forgeries on, B., 380.  
removal of ink from, B., 594.  
removal of printing ink from, (P.), B., 675, 882.  
botanical classification of sources of cellulose for, B., 836.  
chemistry of cellulose in relation to, B., 177.  
use of glucose for making sacks of, B., 837.  
production of leather substitute from, (P.), B., 1075.  
preservation of, in libraries, etc., B., 177.  
classification of, for newspapers, B., 255.  
determination of copper number of, B., 718, 1074.  
for detection of acids and oxidising agents, manufacture of, (P.), B., 978.  
for electrical condensers, (P.), B., 257.  
for food containers, (P.), B., 18.  
adhesive, gumming of, (P.), B., 639.  
bond, water-leaf rag, effect of inorganic acids on physical properties of, B., 1023, 1074.  
carbon, coating composition for, (P.), B., 18.  
cigarette, manufacture of, (P.), B., 1075.  
coated, (P.), B., 978.  
manufacture of, (P.), B., 98.  
drying of, B., 674.  
composite, for containers, (P.), B., 226.  
high-grade, relation of substance to strength of, B., 504.  
marbled, manufacture of, (P.), B., 18.  
mineral fibre, manufacture of, (P.), B., 797.  
mulch, manufacture of, (P.), B., 1075.  
newsprint, treatment of wood pulp fibres for manufacture of, (P.), B., 380.  
ornamental, (P.), B., 18.  
parchment, composition of, A., 725.  
as source of mould spores, B., 816.  
printing, ink-resistance of, B., 718, 837.  
pyro-recording, (P.), B., 1025.  
containing rubber, manufacture of, (P.), B., 882.  
safety, (P.), B., 226.  
production of, (P.), B., 721, 931.  
sized, manufacture of, (P.), B., 977.  
resin-sized, manufacture of, (P.), B., 931.  
stock, regulation of consistency of, B., 1023.  
adjustment of acidity of, B., 1074.  
pulp of, (P.), B., 708.  
tissue, hygroscopic moisture of, B., 766.  
tracing, manufacture of, (P.), B., 977.  
transparent, manufacture of, (P.), B., 225, 977.  
treatment of, (P.), B., 225.  
waste, chemical treatment of, B., 542.  
water-marked, production of, (P.), B., 768.  
water-proof, (P.), B., 18.  
containing wax, (P.), B., 18.  
water-resistant, manufacture of, (P.), B., 257\*.  
waxed, manufacture of, (P.), B., 417.  
coated with fertilisers or insecticides, (P.), B., 596.  
wrapping, porosity of, B., 594.  
determination in, of total acidity, B., 674.  
of  $\alpha$ -cellulose, B., 674.  
of colophony, B., 674.  
of mechanical wood pulp, B., 335, 638, 1024.

- Paper articles, manufacture of, (P.), B., 178.
- Paper board, testing of sizing-resistance of, B., 718.
- Paper mills, alum feed for waters for, B., 1074.
- disposal of waste from, at S. Manchester, Conn., B., 706.
- treatment of waste waters from, B., 914.
- electrometric analysis in, B., 177.
- Paper pulp, manufacture of, (P.), B., 462, 501, 595, 882, 1025.
- from bagasse, etc., (P.), B., 595.
- use of carbon as constructional material in, B., 873.
- digestion of cellulose materials for, (P.), B., 98.
- from printed paper, (P.), B., 303.
- from resinous woods, (P.), B., 720.
- from waste paper, (P.), B., 838.
- with recovery of reagents, (P.), B., 143.
- refractories for use in sulphate recovery furnaces used in, B., 726.
- centrifuge for purification of, (P.), B., 675.
- physical theory of beating of, B., 929.
- beating and refining machines for, (P.), B., 595.
- beaters for, (P.), B., 796.
- drying of, B., 1023.
- drying and conditioning of test sheets of, B., 499.
- digestion and cooking of, (P.), B., 224.
- centrifugal machines for, (P.), B., 629.
- pumps for, B., 673.
- determination of viscosity of, B., 593.
- manufacture of waterproof containers from, (P.), B., 143.
- packing material from, (P.), B., 226.
- examination of, B., 255.
- testing of, (P.), B., 882.
- freeness tester for, (P.), B., 796.
- filled, manufacture of, (P.), B., 462.
- sulphite, manufacture of, (P.), B., 543.
- Parabanic acid, fate of, in dogs, A., 84.
- Parachor and constitution, A., 325, 449, 680, 985.
- Paracrystals, existence and distribution of, A., 1154.
- Paraffin, purification of, (P.), B., 92.
- removal of wax from, (P.), B., 220.
- refractive index of, A., 984.
- scattering of X-rays by, A., 11.
- effect of X- and  $\gamma$ -rays on conductivity of, A., 9.
- crystal structure of, A., 893.
- films, structure of, A., 789.
- H-rays from, A., 1186.
- diffraction of electrons by, A., 553.
- electrochemical oxidation of, B., 790.
- oxidation of, B., 7.
- Paraffins, cracking of, A., 27.
- effect of X- and  $\beta$ -rays on conductivity of, A., 447.
- total and specific heats of, B., 409.
- adsorption of vapours of, by water, A., 1199.
- pyrolysis of, to produce aromatic oils, B., 456.
- substitution products of, A., 495.
- manufacture of fluorine derivatives of, (P.), B., 1019.
- longchain, synthesis, and crystal spacings of, A., 250.
- normal, molecular motion of, near m.p., A., 564.
- solid, rotation of chain molecules in, A., 451.
- cyclo*Paraffins, behaviour of, in Friedel-Crafts reaction, A., 1120.
- thermal reactions of, A., 372.
- Paraffin oil. See Paraffin.
- Paraffin wax, manufacture of, (P.), B., 11.
- purification of, (P.), B., 11, 413.
- crystallisation of, B., 298.
- colouring of, (P.), B., 459.
- sealing of goods from contact with air with, (P.), B., 1025.
- apparatus for sweating of, B., 216.
- dehydrating agents for embedding in, A., 185.
- manufacture of oxidation products of, (P.), B., 539.
- removal of, from mineral oils, (P.), B., 669.
- high-melting, production of, (P.), B., 669, 1069.
- deposition test on, B., 247.
- determination of, B., 376.
- Paraldehyde, production of, (P.), B., 972.
- decomposition of, A., 1094.
- Paralysis, cerebrospinal fluid in, A., 1057, 1280.
- Boltz acetic anhydride test in, A., 1057.
- Paramagnetic atoms, molecules and ions, classification of, A., 112.
- salts, magnetic birefringence of aqueous solutions of, A., 10.
- influence of crystalline fields on, A., 985.
- substances, variations of atomic moment in, A., 112.
- gyromagnetic ratio for, A., 325.
- Paramacium aurelia*, effect of  $p_H$  on division rate of, A., 93.
- Parasepiolite from magnesite deposits, A., 1107.
- Parashorea malaanonan*. See Bagtikan trees, Philippine.
- Parasites, body constituents of, and their hosts, A., 1275.
- Parathormone, action of, A., 1172.
- Parathyroid, influence of, and vitamin-D on bones and growth, A., 1176.
- Paratyphoid, agglutinins of, in serum, A., 960.
- Paravenoms, A., 1155.
- Parkia biglandulosa*, oil from, B., 434.
- Parosela barbata*, constituents of, A., 975.
- Parotid duct, effect of ligation of, on carbohydrate metabolism, A., 644.
- Parraxigenin, and its derivatives, A., 397.
- Parraxin, A., 397.
- Particles, activity and size of, A., 702.
- determination of size of, by sedimentation method, A., 139.
- counting of, A., 1085.
- diffusion of, A., 1081.
- of mass one, A., 1186.
- $\alpha$ -Particles, passage of, through matter, A., 317.
- photodichroism produced by, A., 706.
- penetrating rays excited by, A., 555.
- penetration of, into aluminium, A., 671.
- rate of emission of, A., 555.
- collision of, with atomic nuclei, A., 980.
- with light nuclei, A., 106.
- loss of energy of, A., 317.
- absolute velocity of, A., 671.
- diminution of velocity of, in air, A., 671.
- capture of electrons by, A., 5.
- radiation excited in light atoms by, A., 790.
- scattering of, by light elements, A., 107.
- in helium, A., 1074.
- by helium and hydrogen, A., 106, 107, 790.
- sensitivity of grainless silver bromide emulsions to, A., 1215.
- $\alpha$ -Particles, artificial disintegration by, A., 318.
- from radioactive emanations and from polonium, A., 671.
- $\beta$ -Particles, passage of, through matter, A., 317.
- collisions of, with electrons, A., 791.
- scattering of, by electrons, A., 1074.
- H-Particles, loss of energy of, A., 317.
- Passivity, A., 1000.
- theory of, A., 343.
- topochemistry of, A., 128, 1208.
- of metals, A., 343, 576, 1208.
- Pasteboard, manufacture of, (P.), B., 796.
- impregnation of, with rubber, (P.), B., 797.
- rosin, ash, and reducing substances in, B., 223.
- determination of rosin and fat in, by emulsification, B., 223.
- Pasteurisation apparatus, (P.), B., 580, 663, 785, 1061.
- corrosion of, by milk, B., 470.
- Pastures, feeding value of, B., 1006, 1130.
- and effect of fertilisers thereon, B., 277.
- yield and response to fertilisers of, B., 953.
- effects of fertilisers on chemical composition of vegetation in, B., 522.
- influence of ammonium sulphate on lime content of herbage of, B., 74.
- mineral content of, in relation to depth of sampling, B., 781.
- effect of fertilisers on nitrogen and mineral content of, B., 953.
- movement and fixation of phosphates in relation to fertilisation of, B., 440.
- treatment of, with lime to prevent sheep sickness, B., 73.
- sulphur content of, B., 1096.
- manuring of, B., 567.
- chemical composition of herbs of, B., 953.
- hill, composition of, B., 318.
- improvement of, B., 653.
- Nelson dairying, effect of season and fertilisers on dry matter in, B., 782.
- New Zealand, mineral content of, B., 618.
- permanent, B., 953.
- high-protein, B., 855.
- Pathological conditions, acid-base equilibrium in, A., 187.
- Paullinia cupana*. See Guarana.
- Pavements, composition for, (P.), B., 679.
- materials for, (P.), B., 602.
- Paving blocks, production of, by the dry-press process, B., 343.
- from blast-furnace slag, B., 308.
- from ebonite and stone chippings, (P.), B., 520.
- Paving compositions, (P.), B., 425.
- Paving materials, production of, (P.), B., 468.
- Peas, action of nutrient solutions on, A., 99.
- evolution of carbohydrates during seed formation in, A., 100.
- substance containing cysteine in, A., 204.
- peptisation of proteins of, A., 1202.
- root-rot in, B., 1130.
- starch character of varieties and hybrids of, A., 201.
- Alaska, non-protein nitrogen of, A., 312.
- dried, B., 366.
- loss of glucose from, in soaking, A., 206.
- garden, changes during fruit development in, A., 435.
- changes in composition of, after harvest, B., 954.

- Pea seeds, respiration of, A., 651.
- Peaches, development and ripening of, A., 661.  
control of arsenical injury of, B., 523.  
substitutes for arsenicals for spraying of, B., 39.  
zinc-lime fungicide for, B., 955.  
pathology of canker in, A., 786.  
spraying and dusting for the curculion on, B., 39.  
canned, browning of, B., 1103.
- Peach trees, San José scale on, B., 39.  
young, control of borer in, B., 1130.
- Peanuts, bleaching of, B., 701.  
vitamin-B in, B., 861.
- Peanut oil, from nuts of different ages, B., 994.
- Peas, storage of, B., 526.  
Bartlett, distribution of non-protein nitrogen in shoots of, A., 436.  
seasonal changes in insoluble nitrogen in wood and bark of, A., 1180.  
stored, injury to, A., 101.
- Pear trees, chlorotic and green,  $p_H$  and iron content of tracheal sap from, A., 1180.
- Pearlite, microstructure of, A., 325.  
transformation of, into austenite, A., 686.  
lamellar, formation of, B., 1082.
- Peat, formation of, A., 926.  
micro-organisms in, A., 1016, 1067.  
treatment of, before stacking, (P.), B., 633.  
decolorisation of aqueous extracts of, B., 82.  
carbonisation of, (P.), B., 873.  
ion exchange in, B., 122.  
bacteria in, B., 951.  
dispersible organic colloids in, B., 565.  
catalytic oxidation of humins of, A., 1213.  
effects of stable manure and fertilisers on microbiological activities in, B., 569.  
effect of, on soils, B., 743.  
Italian, B., 407.  
sphagnum, bitumens of, B., 871.  
tensimetric analysis of, B., 1014.
- Peat bitumens. See under Bitumen.
- Peat tar. See under Tar.
- Pecan nuts, vitamin-A in, A., 657.  
determination of oil in, B., 849.
- Pecan rosettes, chemical treatment of, B., 954.
- Pectic acids, determination of, centrifugally, B., 862.
- Pectic substances, determination in, of uronic anhydride groups, A., 602.
- Pectin, A., 367.  
in tobacco, B., 702.  
production of, (P.), B., 47.  
reaction of, with *D*-galacturonic acid, A., 367.  
sols, rôle of acids in gelation of, A., 123, 910.  
preparations from, (P.), B., 527, 959.  
soluble preparations of, (P.), B., 1053.  
preparations of sugar and, (P.), B., 959.  
aerobic fermentation of, A., 429.  
metabolism of. See under Metabolism.  
colloidal, A., 1089.  
detection of, with fruit juice rich in tannin, B., 749.  
gravimetric and volumetric determination of, B., 1006.
- Pectography and constitution of colloidal solutions, A., 122.
- Pectolase, A., 1063.
- Peganum *harmala*, determination of alkaloids of, B., 863.
- Pegmatite from Manitoba, rare minerals in, A., 493.
- Pei-Mu, Chinese, alkaloids of, A., 1178.
- Peimine, and its salts, A., 1178.
- Peiminine, and its salts, A., 1178.
- Pelargonin chloride, synthesis of, A., 1140.
- Pelargonium, starch synthesis in variegated leaves of, A., 1295.
- Pellagra, thiosulphate treatment of, A., 187.  
iron deficiency in, A., 419, 1158.  
influence of solar rays on metabolism of sulphur in, A., 82.
- Pelletierine, comparison of arecoline and, B., 527.
- $\psi$ -Pelletierine, analogues of, A., 1147.
- Pelts. See Skins.
- Peltigera canina*, constituents of, A., 663.
- Pelvetia canaliculata*, *l*-fucose in, A., 436.
- Pencils, manufacture of "lead" for, (P.), B., 1091.
- Penetration, kinetics of, A., 1180.
- Penicillium*, metabolic products of species of, A., 1289.  
injury to maize by, A., 438.
- Penicillium aurantiovirens* and *puberulum*, metabolism of glucose by, A., 651.
- Penicillium crustaceum*, formation of *D*-gluconic acid by, A., 545.
- Penicillium glaucum*, metabolism of lecithin, phytosterol and sugar in, grown in Raulin's solution, A., 195.  
effect of heavy metal salts on growth of, A., 968.  
adsorption of potassium by, in Raulin's solution, A., 195.
- Penicillium luteum purpurogenum*, action of, on aldoses, A., 145.
- Penicillium puberulum*, isolation of ergosterol from, A., 195.
- Penta-acetyl- $\alpha$ -glucoheptosidyl chlorides, A., 46.
- Penta-acetylmethyl- $\alpha$ -glucoheptosides, A., 46.
- Penta-acetyltetrahydropapaverine, A., 527.
- Penta-(*dl*-alanine)-*dl*-alanine, A., 503.
- Penta-*l*-alanine-*l*-alanine, A., 194.
- Penta-arylallyl alcohols, synthesis of, A., 1024.
- Pentaborane, A., 350.
- Penta-*l*-butyryl-*l*- $\alpha$ -aminobutyric acid, penta- $\alpha$ -amino-, A., 954.
- 3-*n*-Pentadecadienylpyrocatechol, A., 102.
- Pentadecane- $\beta$ -*l*-dione disemicarbazone, A., 720.
- Pentadecic acid, *p*-halogenophenacyl esters, A., 744.
- Pentadecic acid,  $\xi$ -hydroxy-,  $\omega$ -polyethylene ester, A., 601.
- Pentadesma butyracea*, seed fat of, B., 354.
- cyclopentadiene*, "dien"-syntheses with, A., 55.
- $\Delta^{\alpha\beta}$ -Pentadiene, addition of hydroxyl groups to, A., 1231.
- Pentaerythritol, production of, (P.), B., 56.
- tetrahalogenohydrins, crystal structure of, A., 564.
- terranitrate, manufacture of, (P.), B., 322, 1105.
- thioethers, A., 363.
- triphenyl methyl ether, A., 42.  
determination of, A., 72.
- Pentacyclohexylethane, A., 608.
- 2:3:4:3':4'-Pentamethoxy- $\omega$ -benzoylacetophenone, A., 621.
- Pentamethyl- $\beta$ -carbethoxyethylpyrromethenes, hydrobromides of, A., 173.
- Pentamethylchlorogenic acid, methyl ester, A., 850.
- N*-Pentamethylene-*S*-di- $\alpha$ -naphthylarsinyl-dithiourethane, A., 954.
- N*-Pentamethylene-*S*-diphenylarsinyl-dithiourethane, A., 954.
- N*-Pentamethylenediphenylenearsinyl-dithiourethane, A., 954.
- N*-Pentamethylenediphenylstibinyl-dithiourethane, A., 954.
- N*-Pentamethylenedi-*p*-tolylstibinyl-dithiourethane, A., 954.
- 5:5-*cyclopentamethylenehydantoin*, A., 862.
- N*-Pentamethylene-6-iodophenoxarsinyl-dithiourethane, A., 954.
- Pentamethylenedithiocarbamic acid, dimethylammonium and strychnine salts, A., 150.  
piperidine salt, manufacture of, (P.), B., 138.  
reaction of, with dihalogenophenyl arsines and diphenyl-arsinyl and -stibinyl iodides, A., 953.  
esters of, A., 509.  
phenylarsinylene ester, A., 954.
- cyclopentamethylenethiocyanic acid*, arsenic salt, A., 528.
- Pentamethyl- $\alpha$ -glucoheptono- $\delta$ -lactone, A., 46.
- 2:3:5:6:7-Pentamethyl- $\alpha$ -glucoheptono- $\gamma$ -lactone, structure of, A., 1113.
- $\alpha$ -Pentamethylglucoheptose, A., 724.
- $\beta$ -Pentamethyl- $\alpha$ -glucoheptose, A., 46.
- $\beta\beta\gamma\zeta$ -Pentamethylheptan- $\gamma$ -ol- $\epsilon$ -one, A., 499.
- Pentamethylheptoside, A., 724.
- Pentamethyl- $\beta$ -methyl- $\alpha$ -glucoheptoside, A., 46.
- Pentamethylpiperazines, and their salts and derivatives, A., 754.
- Pentane, chlorination of, (P.), B., 716.  
oxidation of, A., 344.
- cyclopentane*, 1:2-diamino-, and 1-hydroxy-2-amino-, and their picrates, A., 372.
- iso*Pentane, thermal decomposition of, in presence of silica gel, A., 830.
- neo*Pentane, chlorination of, A., 1016.
- n*- and *iso*-Pentanes, viscosity of vapours of, A., 685.
- cyclopentane* series, reactions catalysed by aluminium chloride in, A., 744.
- Pentane- $\gamma$ -carboxylic acid. *ac*-dibromo-, and its derivatives, and *ac*-dichloro-, A., 950.
- Pentane- $\alpha\beta$ -diol, and its diphenylurethane, A., 143.
- cyclopentanespirocyclohexane*-3:5-dione, derivatives of, A., 738.
- cyclopentane*-1-malonolactone, 1-hydroxy-, A., 614.
- isopentanesulphonic acid*, sodium salt, A., 1018.
- cyclopentanol*s, 2-amino-, and their salts and derivatives, A., 844.
- cyclopentanone*, preparation of, A., 385.
- Pentaphenylallyl alcohol, A., 1024.
- n*- $\Delta^{\alpha}$ -Pentene,  $\alpha\beta$ -tribromo-, A., 362.
- $\Delta^{\beta}$ -Pentene, polymerisation of, with isoprene, A., 830.
- cyclopentene*, action of nitrous anhydride on, and its  $\psi$ -nitrosite, A., 372.
- $\Delta^{\alpha}$ -Pentenoamides, A., 258.
- $\Delta^{\beta}$ -Pentenoic acid, methyl ester, dibromide, A., 1143.
- Pentenitrile, dimeride of, A., 1119.
- $\Delta^{\alpha}$ -Pentenitriles, A., 257.
- n*- $\Delta^{\beta}$ -Pentenyl alcohols, *di*- and *tri*-bromo-, A., 362.
- $\alpha$ - $\Delta^1$ -*cyclopentenyl*- $\Delta^{\alpha}$ -butene, A., 844.
- $\kappa$ -( $\Delta^2$ -*cyclopentenyl*)decylamine, and its derivatives, A., 375.
- $\mu$ -( $\Delta^2$ -*cyclopentenyl*)dodecylamine, and its derivatives, A., 375.
- $\alpha$ - $\Delta^1$ -*cyclopentenylethylene*, A., 844.
- $\alpha$ - $\Delta^1$ -*cyclopentenyl*- $\Delta^{\alpha}$ -propene, A., 844.
- Pentiazolines, A., 758.

- 2-Penthiazolinyllacetic acids, 5-halogeno-, A., 758.
- 2-Penthiazolinyllmalonic acids, 5-halogeno-, and 5-hydroxy-, methyl esters, A., 758.
- n*-4<sup>th</sup>-Pentinenyl alcohol, and its derivatives, A., 362.
- Pentlandite, crystal growth of, A., 682.
- Pentosans, preparation of, (P.), B., 501.  
in soya beans and soya-bean milk, B., 912.  
decomposition of, by soil bacteria, A., 429.  
manufacture of mouldable material from, (P.), B., 16.  
determination of, A., 368.
- Pentoses, reactions of, A., 279, 368.  
methylated, formation of furfuraldehyde from, A., 1236.  
detection of, A., 1178.  
in urine, A., 186.  
determination of, A., 368.
- neo*Pentyl alcohol, and its rearrangement, A., 1017.
- iso*Pentyl mercaptan, additive compound of, with formaldehyde, A., 1114.
- $\Delta^2$ -*cyclo*Pentylallylbarbituric acid, pharmacodynamics of, A., 646.
- cyclo*Pentylamines, 2-chloro-, A., 844.
- $\kappa$ -*cyclo*Pentyldecylamine, and its derivatives, A., 375.
- $\mu$ -*cyclo*Pentyldecylamine, and its derivatives, A., 375.
- $\Delta^1$ -*cyclo*Pentylethylcarbinol, A., 844.
- $\Delta^1$ -*cyclo*Pentylmethylcarbinol, A., 844.
- cyclo*Pentyl methyl ketone, and its semicarbazone, A., 744.
- 2-*cyclo*Pentylcyclopentanone oxime, benzoyl derivative, A., 1133.
- N*-*cyclo*Pentylpiperazine, *N*-2-hydroxy-, and its salts, A., 1042.
- $\Delta^1$ -*cyclo*Pentyl-*n*-propylcarbinol, A., 844.
- Peonin chloride, synthesis of, A., 1140.
- "Peperina." See *Bystropogon mollis*.
- Peppermint, accumulation of essential oil in leaves of, B., 48.
- Peppermint oil, rectification of, B., 80.  
Japanese, produced in Florida, B., 1137.  
determination of, of menthone, B., 161.  
of pulegone, B., 1055.
- Pepsin, action of, on milk, A., 1287.  
synthetic action of, A., 91.  
digestion of egg-albumin by, A., 193.  
synthesis of proteins by, A., 193.  
relation between activity of, and viscosity of digestion mixture, A., 194.  
mitogenetic spectra of digestion by, and of fission of glycylglycine by crepsin, A., 1166.  
loss in activity and formation of turbidity in wines containing, B., 623.  
crystalline, A., 1166.  
determination of, A., 881, 1166.  
Tyndallometrically, A., 1064.
- Peptides, synthesis of, A., 935.  
relation of structure to hydrolysis of, A., 1148.  
serological specificity of, A., 957.  
synthesis of substances resembling, from amino-sugars and amino-acids, A., 837.  
dehydrogenated, enzymic fission of, A., 427.  
proline, enzymic fission of, A., 1064.
- Pepitisation, A., 910.
- physico-chemical analysis of, A., 1202.
- Perbenzoic acid, reaction of, with triphenylmethyl, A., 379.
- Percaine poisoning. See under Poisoning.
- Perchloric acid. See under Chlorine.
- Percolator, B., 131.
- Perfumes, preparation of, from castor oil, B., 516.  
manufacture of, (P.), B., 793.  
action of, in deterioration of scented soaps, B., 777.  
artificial, apparatus for production of, B., 527.
- Perhalides, equilibria of, in aqueous solution, A., 808.
- Perhydroanthracene, A., 1123.
- Perhydrobix, ethyl ester, and its derivatives, A., 1234.
- Perhydrocrocin, derivatives of, A., 1234.
- Perilla oil, iodine value and refractive index of, B., 806.
- Perimidinequinone, 7-hydroxy-, A., 264.
- Periodates. See under Iodine.
- Peristaltin, A., 370.
- Periwinkle, composition of, A., 888.
- Perkin synthesis, A., 56.
- Permalloy, permeability of, in high-frequency electro-magnetic fields, A., 216.  
air-cooled, high permeability of, B., 429, 680.
- Permeability, A., 85, 98.  
and vital staining, A., 295.  
membrane, oxidation-reduction equilibria in, A., 460.  
specific, of capillary systems, A., 119.
- Permeameter, B., 610.
- Permutites, classification and hydrolysis of, A., 120.  
action of alkali sulphides and polysulphides on, A., 350.  
base exchange in, A., 334, 337, 459, 690.  
role of water in, A., 482.
- "Pernocton," pharmacology of, A., 191.
- Perowskite, A., 583.
- Peroxidase, A., 308.  
effect of light on, A., 90.  
activity of, A., 426.  
action of carbon monoxide on, A., 426.  
artificial, fission of starch by, A., 346.  
horse-radish and milk, catalytic oxidation with, A., 1165.  
milk, preparation and properties of, A., 648.  
detection of, histochemically, A., 426.  
with 2:7-diaminofluorene hydrochloride, A., 242.  
with tolidine and toluidine, A., 90.  
determination of, in blood, A., 412.
- $\psi$ -Peroxidase, A., 649.
- Peroxides, thermal dissociation of, A., 228, 573.  
in gasoline, B., 7.  
hydrated, A., 483.  
labile radical, A., 611.  
organic, A., 363, 379.  
preparation of, (P.), B., 56.  
detection of, microchemically, A., 921.  
in ethyl ether, B., 12.  
apparatus for determination of, A., 34.  
determination of, by Lunge's method, in used bleaching liquors, B., 502.  
determination of oxygen evolved by, A., 1102.
- Perparacetaldehyde, A., 1114.
- Perpropionic acid, formation of, in electrolysis of propionic acid, A., 1214.
- Persilicates. See under Silicon.
- Persorption, A., 690.
- Perterephthalic acid, diisopropyl ester, A., 363.
- Pernranates. See under Uranium.
- Perylene, constitution of, A., 731.  
and its derivatives, A., 377, 507, 1035.  
ultra-violet absorption spectra of, A., 107.  
hydrogenation of, A., 507.
- Perylene, diamino-, and its derivatives, A., 377.
- Perylene-3:10-quinone, derivatives of, A., 1035.
- Pests, animal or plant, compositions for destruction of, (P.), B., 530.  
insect, greenhouse, extermination of, (P.), B., 1048.  
plant, material for control of, (P.), B., 956.
- Petrol, production of, (P.), B., 86.  
See also Gasoline.
- Petrolatum, consistency of, B., 1016.  
treatment of, (P.), B., 413.  
Russian, B., 666.
- Petroleum, formation of, from algæ, A., 1016; B., 375.  
production of, and coke, (P.), B., 711.  
magnesium hydroxide for use in, B., 1112.  
metals for plant for, B., 1085.  
coatings for tanks for, B., 900.  
purification of, (P.), B., 249, 876.  
refining of, B., 825.  
with sulphuric acid, B., 760.  
reclaiming of sludgo acid in, (P.), B., 1019.  
removal of aromatic hydrocarbons from, B., 790.  
removal of gum from, (P.), B., 587.  
removal of naphthenic acids from, (P.), B., 92.  
filtration of tar from, (P.), B., 762.  
filters for, (P.), B., 1013.  
cracking of, (P.), B., 90.  
use of aluminium chloride in, B., 825.  
activation of fuller's earth, etc., in, (P.), B., 712.  
distillation of, (P.), B., 218.  
apparatus for, (P.), B., 217.  
arrangement of boiler preheater in, B., 1111.  
steam distillation of light fractions of, (P.), B., 458.  
distillates, physical and thermal properties of, B., 456.  
refining of, (P.), B., 970.  
sweetening of, (P.), B., 492.  
light, desulphurisation of, (P.), B., 492.  
handling of, B., 489.  
Oklahoma, sweetening of, with brucite, B., 872.  
colorimetric detection and determination in, of free sulphur, B., 1065.  
vapour-liquid equilibrium curves of fractions of, B., 1112.  
total heats and specific heats of, B., 409.  
vapour, explosive mixtures of air and, B., 760.  
hydrogenation of, B., 456, 919, 1112; (P.), B., 491.  
steel apparatus for catalytic hydrogenation of, (P.), B., 189.  
"doctor" treatment of, B., 968.  
coking of residues from, (P.), B., 459.  
conversion of residues from, (P.), B., 922.  
naphthenic acids from, A., 1262.  
recovery of alcohols from residues from, (P.), B., 590.  
isolation of *n*-nonane from, B., 169.  
production of oil-soluble material from, (P.), B., 413.  
formation of substance similar to, B., 1063.  
from coal, B., 376.  
Caucasian, acids of, B., 665.  
cracked, olefines in, B., 968.  
crude, treatment of, (P.), B., 636.  
purification of, (P.), B., 635.  
German, B., 327.  
Grozni, manufacture of bright stocks from paraffinic residues from, B., 825.

- Petroleum, heavy, cracking of, under hydrogen pressure, B., 88.  
 Japanese, origin of, B., 297.  
 properties and composition of fractions of, B., 489.  
 light distillates of, B., 168.  
 gasoline fractions of, B., 168, 297, 375, 409, 632.  
 Oklahoma, *n*-decane from, B., 760.  
 $\beta$ -dimethylpentane in, B., 1112.  
 residuum, distillation of, (P.), B., 925.  
 Rumanian, decomposition of, B., 169.  
 determination in, of aromatic hydrocarbons, B., 968.  
 of *n*-heptane and methylcyclohexane, B., 632.  
 of sulphur, B., 968.  
 of sulphur compounds, B., 826.  
 determination and separation of methylcyclopentane in, B., 169.  
 Petroleum asphalt. See under Asphalt.  
 Petroleum beds, radium and helium in, A., 594.  
 Petroleum emulsions. See under Emulsions.  
 Petroleum hydrocarbons. See under Hydrocarbons.  
 Petroleum industry, luminescence analysis in, B., 88.  
 Petroleum oils, purification of, (P.), B., 137, 1113.  
 composition for, (P.), B., 220.  
 refining of, (P.), B., 412, 925.  
 treatment of sludges from, with sulphuric acid, (P.), B., 877.  
 removal of gums from, (P.), B., 714.  
 removal of waxes from, (P.), B., 459.  
 removal of water from, (P.), B., 877.  
 treatment of, (P.), B., 91, 329.  
 cracking of, (P.), B., 10, 136, 329, 411, 668, 712, 875, 926, 970, 1068.  
 distillation of, (P.), B., 925.  
 coking of residues from, (P.), B., 668.  
 distillation and cracking of, (P.), B., 219.  
 rectification of, (P.), B., 877.  
 heat contents of fractions of, at high temperatures, B., 327.  
 critical temperatures of, B., 825.  
 heating of, (P.), B., 668.  
 conversion of, (P.), B., 219, 587, 668, 924, 1068.  
 apparatus for, (P.), B., 219.  
 pyrogenetic decomposition of, (P.), B., 219.  
 hydrogenation or cracking of, (P.), B., 964.  
 hydrogenation of, B., 1112.  
 oxidation of, B., 409.  
 production of low-boiling oils from, (P.), B., 877.  
 production of rubber-like material from, (P.), B., 911.  
 penetration of, into plant tissues, B., 75.  
 use of, as insecticides, B., 39.  
 spray insecticides from, B., 812.  
 cracked, purification of, (P.), B., 92.  
 Petroleum products, removal of gas and low-boiling fractions from, (P.), B., 492.  
 removal of hydrogen sulphide from, (P.), B., 830.  
 treatment of, (P.), B., 413.  
 sweetening of, (P.), B., 412.  
 colorimetry of, B., 760.  
 density of mixtures of, with ethyl alcohol, A., 330.  
 Russian and foreign, B., 666.  
*Petromyces planeri*. See Lampreys.  
 Phæophorbides, and their derivatives, A., 1264, 1265, 1266.  
 Phæophorbide-*B*, iron compound of, (P.), B., 527.  
 Phæoporphyrins, and their salts and derivatives, A., 757, 1045, 1264, 1265.  
 Phæopurpurin 18, and its methyl ester, A., 1263.  
*Phalaris tuberosa*, influence of growth, stage, and frequency of cutting on yield and composition of, B., 1096.  
 Pharmaceutical preparations, sterilisation and preservation of, with "nipagin" and "nipasol," B., 321.  
 examination of, with the turbidimeter, B., 862.  
 copper in, B., 1135.  
 granular effervescent, stability, and storage of, B., 1135.  
 determination in, of enzymes, B., 623.  
 of iodine, B., 750.  
 analysis of, B., 623.  
 Pharmacodynamic substances, effect of, on alkaline reserve and calcium-potassium equilibrium, A., 1061.  
 Pharmacological action and constitution, A., 963.  
 Pharmacology, comparative, A., 963.  
 Phases, boundary properties of, A., 17, 125.  
 Phase rule, A., 996.  
*Phaseolus mungo*, proteolytic enzymes in seeds of, A., 92.  
*Phaseolus vulgaris*. See Beans, navy.  
 Phanthine, and its salts, A., 527, 664.  
*Phanthus ebracteolatus*, alkaloids of, A., 527, 664.  
 Phellodendronlactone, physiological action of, A., 877, 1284.  
 Phenacetin, dimorphism of, A., 1244.  
 determination of, in presence of caffeine and amidopyrin, B., 448.  
 Phenacite, crystal structure of, A., 114.  
 Phenacyl chloride, 2:4:6-tribromo-, A., 514.  
 groups, migration of, A., 854.  
 Phenacylbenzylidimethylammonium salts, and *p*-bromo-, A., 262.  
 Phenacylbenzylmethylsulphonium salts, A., 262.  
 Phenacylhalogenobenzylidimethylammonium salts, and *p*-bromo-, A., 262.  
 Phenacylmethoxybenzylidimethylammonium salts, and *p*-bromo-, A., 262.  
 Phenacylmethylbenzylidimethylammonium salts, and *p*-bromo-, A., 262.  
 Phenacylnitrobenzylidimethylammonium salts, and *p*-bromo-, A., 262.  
 Phenacylphenyldiethylammonium bromide, *m*-nitro-, A., 744.  
 Phenacylpyridinium bromide, and *m*-nitro-, A., 744.  
 Phenanthraquinone, condensation product of, with dibenzyl ketone, and its derivatives, A., 273.  
 dyes derived from, A., 67, 1043.  
 indigoid dyes from, A., 753.  
 Phenanthraquinone, *mono*- and *di*-bromo-, and their derivatives, A., 855.  
 1-chloro-, A., 165.  
 Phenanthrene, constitution of, A., 731, 1123.  
 preparation of, B., 378.  
 and its derivatives, synthesis of, A., 1241.  
 purification of, (P.), B., 497.  
 absorption spectrum of, A., 674.  
 hydrogenation of, B., 172.  
 determination of, in commercial anthracene, A., 182.  
 Phenanthrene, 1-cyano-, A., 1246.  
 Phenanthrene series, A., 855, 1029.  
 Phenanthrene-1-carboxylic acid, and its derivatives, A., 1246.  
 Phenanthrene-3(or 6)-carboxylic acid, 9-bromo-, and its methyl ester, A., 1029.  
 Phenanthrene-9-carboxylic acid, 2-bromo-, A., 612.  
 Phenanthrenecarboxylic acids, A., 1029.  
 Phenanthrenequinone, 1-cyano-, A., 1246.  
 Phenanthrene-3(or 6)-sulphonic acid, 10-bromo-, effect of hydration on crystal lattice of, A., 798.  
 Phenanthridine, manufacture of homologues and derivatives of, (P.), B., 834.  
 nitrates and nitro-derivatives, and 9-amino-, and its salts, A., 1041.  
 Phenanthridine series, A., 1041.  
*o*-Phenanthroline, compounds of, with iron carbonyls, A., 920.  
*spiro*Phenanthroylethylene oxide, and its derivatives, A., 384.  
 Phenarsazine series, nitroso-derivatives of, A., 630.  
 Phenazine-2-carboxylic acid, and its amide, A., 1043.  
*o*-Phenetidine, 4:5-dichloro-, and its derivatives, A., 943.  
 4-*p*-Phenetidinoethoxy-2-methylquinolines, and their salts, A., 951.  
 4-*p*-Phenetidinomethoxy-2-methylquinolines, and their salts, A., 951.  
 4-Phenetidino-2-methylquinolines, and their salts, A., 951.  
 Phenetoles, *dichloronitro*-, A., 943.  
*p*-Phenetoleazoxybenzoyl chloride, A., 942.  
*p*-Phenetoleazoxybenzoylpyrocatechol, and its derivatives, A., 942.  
*p*-Phenetoleazoxybenzoylquinol, and its acetyl derivative, A., 942.  
*p*-Phenetoleazoxybenzoylresorcinol, and its derivatives, A., 942.  
 5-*p*-Phenetylamino-1-*p*-phenetyltetrazole, A., 1044.  
 1-*p*-Phenetyl-5-azidotetrazole, A., 1044.  
 3-*p*-Phenetylbarbituric acid, 4-imino-, and its 1-methyl derivative, A., 756.  
 1-*p*-Phenetyl-5-hydrazinotetrazole, and its derivatives, A., 1044.  
 3-*p*-Phenetyl-1-methyluracil, 4:5-*di*amino-, A., 756.  
 3-*p*-Phenetyl-1-methyluric acid, A., 756.  
 3-*p*-Phenetyl-1-methyl- $\psi$ -uric acid, 4-imino-, A., 756.  
 3-*p*-Phenetyl-1-methylvioluric acid, 4-imino-, A., 756.  
 1-*p*-Phenetyltetrazole, 5-amino-, and its derivatives, and 5-chloro-, and 5-hydroxy-, A., 1044.  
 3-*p*-Phenetyl-1:7:9-trimethyluric acid, A., 756.  
 Pheno- $\alpha$ -acenaphthacridine. See 2:3:1:8-Naphthquinoline.  
 Phenol, preparation of, by dehydrogenation of cyclohexanone, A., 266.  
 production of, (P.), B., 829.  
 and its homologues, (P.), B., 13, 1072.  
 from chlorobenzene, etc., (P.), B., 173.  
 by alkali fusion, B., 1113.  
 from low-temperature tar, (P.), B., 974.  
 purification of, by distillation, (P.), B., 591.  
 density of aqueous mixtures of, A., 990.  
 critical solution temperature of, A., 222.  
 viscosity and density of mixtures of, with sodium oleate and water, A., 1086.  
 adsorption of, from solutions, A., 689.  
 solubility of, in water, A., 1084.  
 equilibrium of, with sodium oleate and water, A., 994.  
 with sodium oleate, xylene, and water, A., 335.  
 catalytic dehydration of, A., 579.  
 action of dehydrating catalysts in cracking and hydrogenation of, A., 51.

- Phenol**, action of catalysts on mixtures of, with hydrogen, A., 156.  
hydrogenation of, A., 378.  
at high pressure, B., 762.  
formation of *cis-cis*-muconic acid and benzoquinone in oxidation of, A., 610.  
condensation of, with propylene, in presence of boron fluoride, A., 1125.  
antiseptic value of ointments of, B., 1054.  
toxicology of, A., 541.  
ethyl ethers, manufacture of, (P.), B., 1072.  
molecular organic compounds of, and their parachors and refractivities, A., 841.  
and *m*-nitro-, compounds of, with styphnic acid, A., 942.  
determination of, in medicaments, antiseptic tablets, lozenges, etc., B., 1135.  
in phenol ointments, B., 1135.
- Phenol**, *o*-amino-, acyl derivatives of, A., 1026.  
*α*-bromo-*isohexoyl* and *isovaleryl* derivatives, A., 1145.  
*m*-amino-, *p*-toluenesulphonyl derivative, A., 375.  
*p*-amino-, electrolytic reduction of nitrobenzene to, B., 112.  
2-amino-4-cyano-, A., 1046.  
tribromo-3-iodo- and 4-nitro-, and di-bromo-3-iodonitro-, A., 378.  
2:4:6-tribromothio-, and its salts, A., 843.  
*o*-chloro-, nitrosation of, and 2-chloro-4-nitroso-, derivatives of, A., 509.  
3-chloro-6-bromo-, and its benzoate, A., 266.  
3-fluoro-4:6-dibromo-, and 3-fluoro-2:4-dibromo-6-nitro-, and their derivatives, A., 266.  
*p*-nitro-, action of, on salt films, A., 569.  
2:4-dinitro-, (P.), B., 414.  
hyperthermal effect of, in inanition and avitaminosis-B, A., 1175.  
2:6-dinitro-, as indicator, A., 586.  
2:3:4:6-tetranitro-, additive compound of, with pyridine, A., 53.  
thio-, dimethylenecammonium salt, A., 48.
- Phenols**, manufacture of, (P.), B., 540.  
from aryl halides, (P.), B., 591.  
from coal tar, (P.), B., 829.  
from coal tar distillates, (P.), B., 538.  
from tars rich in cresote, (P.), B., 829.  
extraction of, from carbolic oils, B., 968.  
from caustic solutions, B., 1113.  
from tar oils with ammonia, B., 408.  
recovery of, from waste liquors from coal carbonisation plant, (P.), B., 587.  
removal and purification of, from hydrocarbons, (P.), B., 10.  
separation of, (P.), B., 833.  
from mixtures, (P.), B., 252.  
thermal behaviour of, at high pressures, A., 841.  
transposition of benzoyl group in, A., 946.  
rate of chlorination of, A., 1002.  
dehydration of, catalytically, A., 1125.  
hydrogenation of, B., 493; (P.), B., 634.  
to produce aromatic hydrocarbons, (P.), B., 1072.  
catalysts for high-pressure hydrogenation of, B., 297.  
nitrosation of, A., 509.  
catalytic reduction of, to aromatic hydrocarbons, B., 326.  
condensation of, with aldehydes, A., 279.  
with benzotrichloride, A., 946.
- Phenols**, condensation of, with ethyl acetosuccinate, A., 520.  
with formaldehyde, A., 610.  
with *α*-formylphenylacetone nitriles, A., 1140.  
and their ethers, condensation of, with acetonedicarboxylic acid, A., 512.  
resinous condensation products of starches and, (P.), B., 518.  
reaction of, with arylsulphonyl chlorides, A., 52.  
with gaseous cyanogen, A., 1245.  
with hexamethylenetetramine, A., 266.  
with phenylthiocarbimide, in presence of aluminium chloride, A., 511.  
action of potassium dichromate on, B., 616.  
silver salts, decomposition of, catalytically, A., 510, 842.  
arsenical derivatives of, A., 528.  
mercury derivatives of, A., 410.  
metalliferous sulphurised derivatives of, (P.), B., 496, 878, 974.  
non-dyeing thio-derivatives of, (P.), B., 332.  
removal of, from liquids, (P.), B., 668.  
from tar, oils, etc., (P.), B., 9.  
from water of distillation of brown coal, B., 216.  
effect of peroxidase on bactericidal action of, A., 308.  
and their derivatives, histochemistry of, A., 185.  
conjugation of, in the organism, A., 962.  
dihydric, bactericidal properties of ethers of, A., 308, 545.  
monohydric, application of Simonis reaction to, A., 64.  
substituted, and germicidal activity, A., 510.  
sulphurised, manufacture of, (P.), B., 763.  
sensitivity of reagents in detection of, A., 1051.  
determination of, B., 715.  
in blood, A., 1271.
- Phenols**, amino-, detection of, in dyed leather, B., 662.  
*o*-amino-, migration of acyl groups in, A., 51.  
reaction of, with ethyl oxalate, A., 1244.  
*o*-aminothio-, production of, (P.), B., 56.  
condensation of, with aldehydes and ketones, A., 286.  
bromo-, replacement of bromine in, by nitro-group, A., 266, 378.  
bromo-, bromodinitro-, chloro-bromo- and -iodo-dinitro-, iododinitro-, and dinitro-, derivatives of, A., 734.  
monochloro-, bactericidal action of mixtures of, A., 431.  
halogeno- and nitro-, condensation of, with ethyl alkylacetacetates, A., 519.  
nitro-, adsorption of, by films of barium chloride, A., 689.  
reaction of, with *p*-toluenesulphonyl chloride, A., 734.  
determination of, potentiometrically, A., 1051.  
dinitro-, electrolytic reduction potentials of, A., 231.  
nitroso-, A., 734.  
detection of, by means of diazomethane, A., 734.  
thio-, manufacture of, (P.), B., 540.  
reaction of, with benzhydrol and triphenylcarbinol, and their chlorides, A., 1027.
- Phenol alcohols**, formation of, A., 610.
- Phenol ethers**, action of cyanogen bromide on, A., 53.  
Phenol-*α*-*l*-arabinoside, and its triacetate, A., 776.  
Phenolarsinic acids, amino-, acyl derivatives, manufacture of soluble salts of, (P.), B., 864.  
Phenolates, manufacture of, (P.), B., 591.  
Phenol-*α*-glucoside, *p*-amino-, synthesis of, A., 957.  
Phenolic compounds, reaction of, with hexamethylenetetramine, A., 946.  
Phenolisatin, 5-iodo-. See 3:3-Diphenyl-oxindole, 5-iodo-3:3-di-*p*-hydroxy-.  
Phenol-*d*-mannosides, A., 1063.  
Phenolphthalein, salts of, A., 946.  
resins from, B., 272.  
detection of, in medicines, B., 287.  
determination of, in medicinal tonics, etc., B., 47.  
Phenolphthalein, di- and tetra-halogeno-derivatives, and their dimethyl ethers, A., 613.  
tetraiodo-, sodium salt, effect of, on bile, A., 880.  
Phenolpyrazinedicarboxylein, *m*-amino-, A., 66.  
Pheno-*αβ*-naphthazines, amino-, and their derivatives, A., 265.  
Phenoxide, thio-, sodium, velocity of reaction between potassium persulphate and, A., 345.  
Phenoxides, alkali, effect of heat on solutions of, A., 841.  
*p*-Phenoxyacetophenone, *ω*-trichloro-, A., 59.  
4'-Phenoxybenzophenone, 4-amino-, and its derivatives, A., 1125.  
4-*p*-Phenoxybenzoylphenyldibromoarsine, A., 953.  
4-*p*-Phenoxybenzoylphenyldichloroarsine, A., 953.  
4-*p*-Phenoxybenzoylphenyldiiodoarsine, A., 953.  
*κ*-Phenoxydecane, *α*-bromo-, A., 1029.  
*β*-Phenoxy-*αα*-diphenylethane, A., 608.  
*β*-Phenoxy-*αα*-diphenylethylene, A., 608.  
*γ*-Phenoxy-*α*-ethylbutyronitrile, A., 727.  
*β*-Phenoxyethylpyridinium bromide, and 3-hydroxy-, A., 622.  
*α*- and *γ*-Phenoxyhexanes, A., 610.  
*α*-Phenoxy-*Δβ*-hexene, A., 610.  
*λ*-Phenoxyauric acid, A., 1029.  
2-Phenoxy-1-naphthyl disulphide, *o*-nitro-, A., 156.  
Phenoxyphenylphenylethane, and its acetyl derivative, A., 379.  
4-Phenoxyphenylarsinic acid, 3-amino-, and 3-amino-4-*p*-chloro-, and 3-nitro- and 3-nitro-4-*p*-chloro-, A., 1049.  
Phenoxyphenylpropionic acid, *α*-amino-*β*-4:4'-hydroxy-, A., 1130.  
*β*-*p*-Phenoxyphenylpropionic acid, *α*-amino-*β*-2-fluoro-4-*p*-hydroxy-, A., 1247.  
*γ*-Phenoxypropylacetone, and its semicarbazone, A., 288.  
4-Phenoxytoluene-3-sulphinic acid, *p*-nitro-, A., 735.  
4-Phenoxy-*m*-tolyl disulphide, *o*-nitro-, A., 156.  
Phenyl acetyl ethers, trihalogeno-, A., 510.  
alkyl ethers, rearrangement of, by boron fluoride, A., 735.  
alkyl sulphides, *p*-hydroxy-, and their germicidal properties, A., 1244.  
alkyl and aryl sulphides and sulphones, 2:4-dinitro-, A., 719.  
benzyl and propyl ethers, bromo- and chloro-, A., 26.

- Phenyl bromide and iodide, dielectric constants and electric moments of, in solution, A., 447.
- $\gamma$ -chloro- $\Delta^2$ -propenyl ether, *p*-bromo-, A., 610.
- diphenylmethyl sulphide, A., 1027.
- ethyl and methyl sulphides, 2:4:6-tri-bromo-, A., 844.
- glycidyl ether, preparation of, A., 599.
- groups, substitution in compounds containing, A., 838, 1240.
- affinity capacity of, A., 392, 394.
- transference of, from an organometallic derivative to another metal, A., 1148.
- hexyl ether. See  $\alpha$ -Phenoxyhexane.
- 4-hydroxy-*m*-tolyl sulphide, 2-nitro-, and its acetyl derivative, A., 156.
- 4-nitro-, A., 735.
- mercaptan, additive compound of, with formaldehyde, A., 1114.
- $\beta$ -naphthyl and sulphino- $\beta$ -naphthyl and *p*-tolyl ethers, nitro-, A., 156.
- o*-phenylene phosphite, and *o*-hydroxy-, acetyl derivative, and phosphate, A., 379.
- propargyl ether, and its derivatives, A., 509.
- isopropyl ether, *m*-amino-, and its derivatives, and 3-chloro-4-nitro-, *m*-nitro-, and 4-nitro-3-amino-, A., 510.
- p*-amino-, acetyl derivative, (P.), B., 80.
- $\gamma$ -propylalyl ether. See  $\alpha$ -Phenoxy- $\Delta^2$ -hexene.
- triphenylmethyl sulphide, and 2:4-di-nitro-, A., 1027.
- $\beta$ -Phenyl alkyl bromides, action of sodium amide on, A., 152.
- 2-Phenylacenaphthiminazoles, 4'-amino-, acetyl derivative, *mono*- and *di*-hydroxy-, 2'-hydroxy-4'-bromo-, nitro-, *mono*- and *di*-nitro-4'-amino-, acetyl derivatives, and 3-nitro-4'-chloro-, A., 286.
- Phenylacetamidine hydrochloride, *p*-hydroxy-, A., 55.
- Phenylacet- $\beta$ -*m*-benzyloxyphenylethylamide, A., 1040.
- Phenylacet-3':4'-diethoxyanilide, *o*-chloro-, A., 1034.
- Phenylacet-4'-dimethylaminoanilide, *m*-chloro-, A., 1034.
- Phenylacetic acid, nitration of, A., 511.
- esters, nitration of, A., 846.
- tert*-butyl ester, A., 846.
- $\alpha$ -naphthyl ester, A., 1251.
- p*-phenylphenacyl ester, A., 745.
- $\alpha$ - $\beta$ -phenylpropionamidophenyl ester, A., 1026.
- Phenylacetic acid, chloro-, magnesium salt, reaction of, with aliphatic magnesium compounds, A., 816.
- m*-chloro-, A., 1034.
- 2:6-dichloro-, A., 386.
- $\alpha$ -cyano-, chloride, A., 526.
- p*-nitro-, benzyl ester, A., 69.
- nitro-3:4-dihydroxy-derivatives, A., 56.
- dithio-, *as*-phenylmethylhydrazide, A., 51.
- Phenylacetiminoether hydrochloride, *p*-hydroxy-, A., 55.
- Phenylacet-3':4'-methylenedioxyanilide, *p*-chloro-, A., 1034.
- $\alpha$ -Phenylacetacetamide, A., 739.
- Phenylacetonitrile, reaction of, with sodium, A., 382.
- with sodium ethoxide, A., 738.
- Phenylacetonitrile,  $\alpha$ -amino-, acetyl derivative, A., 256.
- l*-Phenylacetonitrile,  $\alpha$ -amino-, and its derivatives, A., 606.
- p*-Phenylacetophenone oxime, A., 263.
- p*-Phenylacetophenone,  $\omega$ -bromo-, A., 754.
- Phenylacetic acid, synthesis of, in dogs, A., 645.
- Phenylacetylene, catalytic hydrogenation of, A., 1231.
- Phenylacetylene, *p*-bromo-, A., 374.
- Phenylacetylene oxide. See Phenylloxen.
- 2-Phenylacetyl- $\alpha$ -naphthol, derivatives of, A., 520.
- N*-Phenyl-3-acetyl-5-phenyl-2-methylpyrrole, and its derivatives, and *p*-nitro-, A., 1263.
- $\alpha$ -Phenylacetyl-tetrahydrobenzoic acid, and its oxime, A., 269.
- Phenyl  $\beta$ -acetylthiol- $\beta$ -phenylethyl ketone, A., 745.
- Phenylallopahnic acid, *p*-nitro-, ethyl ester, A., 597.
- Phenylalanine, oxidation of, in the organism, A., 876.
- detection and determination of, A., 1150.
- Phenylalkyl alcohols,  $\beta$ -amino- $\alpha$ -hydroxy-, manufacture of, (P.), B., 636.
- Phenylalkylsulphones, nitration of, A., 729.
- 3-Phenyl-5-allyl-1-methyl-5-propylbarbituric acids, dibromides of, A., 1043.
- Phenylaminoalcohols, deamination of, A., 395.
- Phenylaminocamphor, derivatives of, A., 166.
- Phenyl  $\alpha$ -aminoethyl ketone, *o*-hydroxy-, and its hydrochloride, and 2:4-dihydroxy-, hydrochloride, A., 157.
- $\alpha$ -Phenylaminoglyoxime, tricarbanil derivative, A., 513.
- 1-Phenylamino- $\beta$ -naphthol, *m*-amino-, A., 379.
- $\alpha$ -Phenyl-*n*-amyl alcohol,  $\beta$ -amino-, and its hydrochloride, A., 395.
- l*- $\alpha$ -Phenyl-*n*-amyl chloride, A., 1028.
- $\alpha$ -Phenyl- $\beta$ -amylacetylene, A., 269.
- $\alpha$ -Phenyl- $\alpha$ - $\beta$ -amylene glycol, A., 392.
- $\alpha$ -Phenyl- $\Delta^2$ -amylene oxide, A., 392.
- $\alpha$ -Phenyl-*n*-amyl ethyl ketone, and its semicarbazono, A., 393.
- Phenyl isoamyl ketone, and its semicarbazono, A., 393.
- $\alpha$ -Phenylamylmalonic acid, ethyl ester, A., 846.
- $\alpha$ -Phenyl-*n*-amyl methyl ketone, and its semicarbazono, A., 393.
- $\alpha$ -Phenyl-*n*-amyl  $\alpha$ -propyl ketone, and its semicarbazono, A., 393.
- Phenylanisylacetaldehydes, and their semicarbazones, A., 390.
- $\gamma$ -Phenyl- $\alpha$ -anisyl- $\beta$ -benzyl- $\Delta^2$ -propene, A., 389.
- $\gamma$ -Phenyl- $\alpha$ -anisyl- $\beta$ -benzyl- $\alpha$ - $\beta$ -propylene oxide, A., 389.
- $\alpha$ -Phenyl- $\alpha$ -anisylbutyl alcohol, A., 394.
- Phenyl- $\alpha$ -anisyl- $\Delta^2$ -butylene, and its oxide, A., 394.
- $\alpha$ -Phenyl- $\alpha$ -*o*-anisylethanol, A., 390.
- r*- $\alpha$ -Phenyl- $\beta$ -anisylethan- $\alpha$ -ol,  $\beta$ -amino-, and its hydrochloride, A., 746.
- $\alpha$ -Phenyl- $\beta$ -anisylethyl alcohol, A., 516.
- $\beta$ -Phenyl- $\alpha$ -anisylethylamine,  $\beta$ -hydroxy-, and its hydrochloride, A., 391.
- $\beta$ -Phenyl- $\beta$ -*p*-anisylethylamine,  $\beta$ -hydroxy-, and its hydrochloride, A., 391.
- $\alpha$ -Phenyl- $\alpha$ -*o*-anisylethylene iodohydrin, A., 390.
- 2-Phenyl-3-*p*-anisylindone, A., 848.
- N*'-Phenyl-*N*-*o*-anisyl-*N*-methylbenzamide, and its picrate, A., 1242.
- $\gamma$ -Phenyl- $\alpha$ -*p*-anisyl- $\Delta^2$ -propenyl alcohol, and its derivatives, A., 53.
- $\alpha$ -Phenyl- $\beta$ -anisylpropionic acid, and its methyl ester, A., 1047.
- 9-Phenylanthracene-1:2-dicarboxylic acid, and its anhydride, A., 274.
- 9-Phenyl- $\gamma$ -anthranol, 10-hydroxy-, dye derivative from, A., 1038.
- 10-Phenylanthrone, 1:8-dichloro-10-bromo-, A., 395.
- 9-Phenyl-10-anthrone-1:2-dicarboxylic acid, A., 274.
- Phenylarsines, and halogeno-, interaction between, A., 1049.
- dihalogeno-, substituted, A., 953.
- Phenylarsine oxide, *m*-amino-*p*-hydroxy-, as antisiphilitic agent, A., 769.
- Phenylarsinic acid, and *p*-amino-, acetyl derivative, compounds of, with hydrochloric acid, A., 1049.
- Phenylarsinic acid, *p*-amino-, derivatives of, A., 290.
- 2-bromo-4-nitro-, and its sodium salt, A., 181.
- Phenylarsinic acids, 4-halogeno-3-nitro-, condensation of, with aliphatic amino-compounds and phenols, A., 1049.
- Phenylarsinonide, 4-amino-2-hydroxy-, acetyl derivative, A., 1268.
- Phenylazide, and *p*-bromo-, reaction of magnesium acetylenyl bromide with, A., 172.
- Phenylazoxycarbonamide, diazo-resin from, A., 942.
- Phenylbenzaldoxime peroxide, *m*-chloro-, A., 272.
- Bz*-3-Phenylbenzanthrone, A., 731.
- 2-Phenyl-3:4-benzfluorenone, A., 1257.
- N*-Phenylbenziminio-*o*-chlorophenyl ether, *o*-chloro-, A., 846.
- N*-Phenylbenziminophenyl ether, 3:5-dichloro-, A., 846.
- 4'-Phenylbenzophenone, 4-chloro-, A., 515, 1240.
- 2-Phenylbenzopyrylium salts, halogeno-, nitration of, and *mono*- and *di*-bromo-, *mono*- and *di*-chloro-, and bromo- and chloro-nitro-, A., 949.
- 1-Phenylbenzotriazole, 5-amino-, benzoyl derivative, and 5-carboxyanilide, A., 66.
- Phenyl  $\beta$ -benzoylthiol- $\beta$ -phenylethyl ketone, A., 745.
- 2-Phenylbenzthiazole, 6-amino-2-*p*-amino- and 6-*p*-nitroamino-2-*p*-nitro-, and its benzoyl derivative, A., 68.
- 5-cyano-, A., 1046.
- 2-Phenylbenzthiazole-5-carboxylic acid, synthesis of, and its derivatives, A., 1046.
- Phenylbenzylacetaldehyde, A., 392.
- Phenylbenzylamine, 2:4-dinitro-, A., 1124.
- $\alpha$ -Phenyl- $\alpha$ -benzylbutaldehyde semicarbazono, A., 393.
- $\alpha$ -Phenyl- $\beta$ -benzyl-*n*-butane- $\alpha$ - $\beta$ -diol, A., 393.
- $\alpha$ -Phenyl- $\beta$ -benzylbutan- $\beta$ -ol, A., 393.
- $\alpha$ -Phenyl- $\beta$ -benzyl- $\Delta^2$ -butylene, and its oxide, A., 393.
- Phenyl benzyl 1:2-diketones, *p*-bromo- and *p*-chloro-, and their quinoxaline derivatives, A., 1031.
- Phenylbenzylethylacetonylphosphonium chloride, A., 1268.
- $\alpha$ -Phenyl- $\beta$ -benzyl- $\beta$ -ethylethylene glycol, A., 393.
- 4(5)-Phenyl-2-benzyl-1-ethylglyoxaline, and its salts, A., 371.
- Phenylbenzylethylphenacylphosphonium bromide, A., 1268.
- N*-Phenyl-4-benzylidenemorphthalimide, A., 624.
- 2-Phenyl-4-benzylidene-5-oxazolone, reaction of, with *p*-tolylmercaptan, A., 511.
- 2-Phenyl-3-benzylindone, ozonide from, A., 396.
- Phenyl benzyl ketone, *p*-bromo-, A., 158.



- $\alpha$ -Phenyl- $\beta$ -benzyl- $\gamma$ -methyl-*n*-butane- $\alpha$ - $\beta$ -diol, A., 393.  
 $\alpha$ -Phenyl- $\beta$ -benzyl- $\gamma$ -methyl- $\Delta^a$ -butylene, and its oxides, A., 393.  
 2-Phenyl-4-(3'-benzyloxy-4'-methoxybenzylidene)oxazolone, A., 175.  
 $\alpha$ -Phenyl- $\beta$ -benzylpentan- $\beta$ -ol, A., 393.  
 $\beta$ -Phenyl- $\beta$ -benzylpentan- $\alpha$ -ol, A., 393.  
 $\alpha$ -Phenyl- $\beta$ -benzyl- $\Delta^a$ -pentene, and its oxide, A., 393.  
 $\beta$ -Phenyl- $\alpha$ -benzylpropaldehyde, and its derivatives, A., 143, 395.  
 $\alpha$ -Phenyl- $\beta$ -benzylpropan- $\beta$ -ol, A., 393.  
 $\alpha$ -Phenyl- $\alpha$ -benzylpropionitrile, A., 393.  
 $\gamma$ -Phenyl- $\beta$ -benzyl- $\alpha$ -propylene oxide, A., 395.  
 $\alpha$ -Phenyl- $\alpha$ -benzylvaleraldehyde, and its semicarbazone, A., 393.  
 $\alpha$ -Phenyl- $\alpha$ -benzylvaleric acid, derivatives of, A., 393.  
 8-Phenylberberine salts, A., 177.  
 8-Phenylberberubine, and its hydrochloride, A., 177.  
 Phenylbis-3:5-dichlorophenylbenzamides, A., 846.  
 Phenylboric acid, additive compound of, with diethylamine, A., 836.  
 Phenyl *m*-bromoanilinobenzyl ketone, A., 396.  
 Phenyl*di*bromoarsines, *o*-iodo-, and nitro-, A., 953.  
 Phenyl  $\alpha$ -bromo- $\beta$ -benzylaminostyryl ketone, A., 745.  
 Phenyl  $\alpha$ -bromo- $\beta$ -diethylaminostyryl ketone, A., 745.  
 Phenyl  $\alpha$ -bromoethyl ketone, *m*-nitro-, A., 744.  
 Phenyl *mono*-, *di*-, and *tri*-bromo-4-hydroxy-3-methoxystyryl ketones, A., 516.  
*N*'-Phenyl-*N*-*o*-bromophenyl-*N*-methylbenzamidine, and its picrate, A., 1242.  
 Phenyl-*p*-bromophenyl- $\beta$ -phenylacetylenylcarbinol, A., 736.  
 $\gamma$ -Phenyl- $\alpha$ -*p*-bromophenyl- $\Delta^a$ -propenyl alcohol, A., 54.  
 1-Phenyl-4-*p*-bromophenyltriazeno-1:2:3-triazole, and its derivatives, A., 172.  
 Phenyl  $\alpha$ -bromo- $\beta$ -piperidinostyryl ketone, A., 745.  
*cis*-Phenylbutadiene, oxidation of, by perbenzoic acid, and its dioxide, A., 729.  
 $\alpha$ -Phenylbutadiene oxides, A., 729.  
 $\delta$ -Phenyl- $\alpha$ - $\gamma$ -butadienecarboxylic acid, fate of, in the body, A., 86.  
 $\gamma$ -Phenyl-*n*-butane- $\alpha$ - $\gamma$ -diol, A., 1110.  
 $\alpha$ -Phenyl- $\Delta^a$ -butene,  $\alpha$ - $\gamma$ -*di*bromo-, and  $\gamma$ -*di*hydroxy-, and its salts, A., 729.  
 $\gamma$ -Phenyl- $\Delta^a$ -buten- $\alpha$ -ol, A., 1110.  
 $\alpha$ -Phenyl-*n*-butyl alcohol,  $\beta$ -amino-, and its salts, A., 395.  
 $\gamma$ -Phenyl-*n*-butyl alcohol, A., 1110.  
*l*- $\alpha$ -Phenyl-*n*-butyl chloride, A., 1027.  
 Phenylbutylacetylene, A., 142.  
 $\alpha$ -Phenyl- $\beta$ -butylacetylene, A., 269.  
 Phenyl  $\alpha$ -butylamyl ketone, A., 368.  
*N*-Phenyl-*n*-butylcarbamide, *N*-*p*-nitro-, A., 597.  
*d*-Phenyl-*n*-butylcarbinol, and its cinchonidine hydrogen phthalate, A., 1027.  
 1-Phenyl-4-*sec*-butyl-3:5-diketopyrazolidine, A., 1143.  
 $\alpha$ -Phenyl- $\alpha$ -butylene glycol, A., 392.  
 $\alpha$ -Phenyl- $\Delta^a$ -butylene oxide, A., 392.  
 1-Phenyl-4-*isobutyl*hydantoic acid, *p*-nitro-, A., 598.  
 3-Phenyl-1-*tert*-butylhydrindene, A., 505.  
 Phenyl butyl ketone, 2:4:6-*tri*hydroxy-, synthesis of, A., 854.  
 $\delta$ -Phenylbutylmalonic acid, diethyl ester, A., 1131.  
 $\alpha$ -Phenylbutyl methyl ketones, and their semicarbazones, A., 393.  
 $\delta$ -Phenyl-*n*-butyl methyl ketone, and its semicarbazone, A., 394.  
 $\delta$ -Phenylbutylsuccinic acid, and its derivatives, A., 1131.  
 Phenyl-*n*-butylsulphone, and nitro-, A., 729.  
 $\alpha$ -Phenylbutyric acid, derivatives of, A., 738.  
 $\alpha$ -Phenylbutyric acid,  $\alpha$ -amino-, hydrochloride, A., 862.  
*d*- $\beta$ -Phenylbutyric acid, A., 1027.  
 $\beta$ -Phenylbutyric acid,  $\alpha$ -hydroxy-, and its nitrile, A., 613.  
 $\alpha$ -Phenylbutyronitrile, reaction of, with sodium ethoxide, A., 738.  
 $\alpha$ -Phenylbutyronitrile,  $\gamma$ -chloro-, and  $\gamma$ -hydroxy-, A., 739.  
*N*-Phenylcamphorimide, 2':4'-*dichloro*-, A., 1253.  
*N*-Phenylcarbamic acid,  $\beta\beta\beta$ -tribromoethyl ester, A., 367.  
 Phenylcarbamic acid, *p*-nitro-, esters, A., 597.  
 Phenylcarbamide, condensation of, with chloral, A., 151.  
 $\alpha$ -Phenylcarbamido- $\beta$ - $\gamma$ -*di*hydroxy-*n*-butyric acid, A., 936.  
 $\alpha$ -Phenylcarbamido- $\alpha$ -phenylbutyric acid, A., 862.  
*N*-Phenylcarbamyloxy-*p*-nitro-, A., 597.  
*N*-Phenylcarbamyloxy-*p*-nitro-, A., 597.  
*N*-Phenylcarbazole, 1:3:6:8-*tetra*nitro-, A., 267.  
 Phenyl *p*-carbethoxyanilinobenzyl ketone, A., 396.  
 Phenylcarbimide, reaction of, with acetone phenylhydrazone, A., 942.  
 with  $\omega$ -anilino-1- $\beta$ -hydroxynaphthylmethane, A., 62.  
 with  $\omega$ -anilinophenyl- $\beta$ -hydroxynaphthylmethanes, A., 157.  
 Phenylcarbimide, *p*-nitro-, use of, as a reagent for alcohols and amino-compounds, and its polymeride, A., 597.  
 reaction of, with higher alcohols, A., 1232.  
 Phenylcarbamido-*dl*-leucyl-*dl*-leucylglycylbenzylamine, A., 184.  
 Phenyl  $\omega$ -*p*-carboxymethylanilinobenzyl ketone, A., 396.  
 Phenylcarbylamine, reactions of, A., 262.  
 reaction of, with nitrosobenzene, A., 403.  
 Phenylcarbylamine, *p*-amino-, A., 733.  
 Phenyl chloroanilinobenzyl ketones, A., 396.  
 Phenyl*di*chloroarsine hydrochloride, 3-amino-4-hydroxy-, A., 1268.  
 Phenyl *p*-chlorobenzyl ketone, *p*-bromo-, A., 158.  
 $\beta$ -Phenyl- $\alpha$ -chlorobenzylpropionic acids, and their derivatives, A., 1243.  
*N*-Phenyl-*N*'- $\beta\beta\beta$ -trichloro- $\alpha$ -ethoxyethylcarbamide, and its *N*-acetyl derivative, A., 151.  
 Phenyl chloro-4-hydroxy-3-methoxystyryl ketones, A., 516.  
*N*-Phenyl-*N*'- $\beta\beta\beta$ -trichloro- $\alpha$ -methoxyethylcarbamide, and its *N*-acetyl derivative, A., 151.  
 Phenyl *p*-chlorophenyl*di*-*p*-tolylmethyl ketone, *p*-chloro-, A., 515.  
*N*'-Phenyl-*N*- $\alpha$ -chlorophenyl-*N*-ethylbenzamidine, and its picrate, A., 1242.  
 2-Phenyl-3-*p*-chlorophenylindone, A., 848.  
*N*'-Phenyl-*N*-chlorophenyl-*N*-methylbenzamides, and their picrates, A., 1242.  
 $\alpha$ -Phenyl- $\gamma$ -chlorophenyl- $\beta$ -propylamines, and their salts and benzoyl derivatives, A., 1243.  
 2-Phenyl-5-chlorostyrylindoxyls, 6-nitro-, A., 176.  
 3-Phenyl-5- $\alpha$ -chlorostyrylisatogen, 6-nitro-, A., 176.  
 2:5-(2-Phenylchromano-3:4)-quinoline, A., 175.  
 $\alpha$ -Phenylcinnamaldehyde, derivatives of, A., 506.  
 $\beta$ -Phenylcinnamamide, A., 163.  
 $\alpha$ -Phenylcinnamic acid,  $\alpha$ -amino- $\alpha$ -*m*-bromo-, and  $\alpha$ -nitro- $\alpha$ -*m*-bromo-, A., 612.  
*m*-bromo- $\alpha$ -*p*-hydroxy-, and its *O*-acetyl derivative, A., 1047.  
 10-Phenylcoeranthr-7-one-5:3':5':2':4'-pentacarboxylic acid, A., 732.  
 3-Phenylcoumarin, 6:7-*di*hydroxy-, and its diacetyl derivative, A., 1140.  
 $\alpha$ -Phenyl- $\beta$ -3-coumarinylethylene,  $\alpha$ -hydroxy-, and its acetate, A., 519.  
 Phenylcrotonic acid,  $\beta$ -*p*-hydroxy-, A., 513.  
 $\alpha$ -Phenylcrotononitrile, A., 739.  
 Phenylcyanofurazan, A., 272.  
 Phenylcyanoglyoxime, and its salts and derivatives, A., 272.  
 $\zeta$ -Phenyldecane,  $\alpha$ -bromo-, A., 847.  
 $\zeta$ -Phenyldecane- $\alpha$ -ol, A., 847.  
 $\epsilon$ -Phenyldecoic acid, and its *p*-bromophenacyl ester, A., 847.  
 Phenyldeacylmalonic acids, ethyl esters, A., 846.  
 Phenyl*di*alkyl glycols, dehydration of, A., 393.  
 1-Phenyl-2:3-dialkyl-5-pyrazolones, compounds of, with alkali metal salts of 2-phenylquinoline-4-carboxylic acid, (P), B., 251.  
 3-Phenyl-5:5-diallyl-1-methylbarbituric acid, *tetrabromide* of, A., 1043.  
 $\beta$ -Phenyl- $\alpha$ - $\gamma$ -*di*aminophenylguanidines, A., 376.  
 Phenyl*di*-*n*-amylarsine, A., 1120.  
 Phenyl*di*-*p*-anisylacetic acid, *p*-hydroxy-, and its salts, A., 855.  
 $\alpha$ -Phenyl- $\beta$ - $\beta$ -*di*-*p*-anisylacrylic acid, A., 848.  
 Phenyl*di*-*p*-anisylcarbinol, *p*-hydroxy-, and its salts and acetyl derivative, A., 855.  
 $\psi$ -Phenyl*di*-*p*-anisylcarbinol, *p*-hydroxy-, A., 855.  
 Phenyl*di*-*p*-anisylmethane, *p*-hydroxy-, A., 855.  
 $\beta$ -Phenyl- $\alpha$ - $\alpha$ -*di*-*p*-anisylpropaldehyde, A., 273.  
 $\gamma$ -Phenyl- $\alpha$ - $\alpha$ -*di*-*p*-anisylpropan- $\beta$ -one, A., 273.  
 $\alpha$ -Phenyl- $\beta$ - $\beta$ -*di*-*p*-anisylvinyl bromide, A., 848.  
 9-Phenyl-1:2:7:8-dibenzoxanthene, 9-*p*-chloro-. See *ms*-Phenyldinaphthopyran, *ms*-*p*-chloro-.  
 9-Phenyl-1:2:7:8-dibenzoxanthanol, *p*-chloro-. See *ms*-Phenyldinaphthopyran, *p*-chloro-.  
 $\beta$ -Phenyl- $\beta$ - $\beta$ -dibenzylethyl alcohol, A., 1246.  
 Phenyl*di*benzylethylphosphonium bromide, A., 1268.  
 2-Phenyl-1:3-dibenzylindene, 1-hydroxy-, A., 396.  
 2-Phenyl-3:3-dibenzylindolenine, A., 1261.  
 Phenyl*di*benzylmethylammonium bromide, A., 854.  
 7-Phenyl- $\alpha$ - $\alpha$ -*di*-*p*-dimethylaminophenylpentan- $\gamma$ -ol, A., 59.

Phenyldiethylarsinehydroxy-*p*-toluenesulphonamide, A., 528.  
*N*-Phenyldiethylcarbamide, *N*-*p*-nitro-, A., 597.  
 1-Phenyl-4:4-diethyl-3:5-diketopyrazolidine, A., 1143.  
*N*-Phenyl-4:4-diethylhomophthalimide, A., 624.  
 1-Phenyldihydronaphthalene, A., 56.  
 Phenyldihydro- $\alpha$ -naphthoisindazoles, A., 863.  
 9-Phenyl-9:10-dihydrophenanthrene, A., 382.  
 9-Phenyl-9:10-dihydrophenanthrene-10-carboxylic acid, and its derivatives, A., 382.  
 10-Phenyl-5:10-dihydrophenarsazine, 5-nitroso-, A., 630.  
 3-Phenyl-1:3-dihydrophthalazine-4-acetic acid, 1-hydroxy-3-(2'-chloro-4'-nitro)-, and its derivatives, A., 284.  
 3-Phenyl-1:3-dihydrophthalazine-1-sulphonic-4-acetic acid, 3-(2'-chloro-4'-nitro)-, sodium hydrogen salt, A., 284.  
 2-Phenyl-5:6-dihydro-1:4-pyran-6-carboxylic acid, 3-cyano-, and its anilide, A., 279.  
 2-Phenyl-5:6-dihydro-1:4-pyran-3:6-dicarboxylic acid, A., 279.  
 1-Phenyldihydroresorcinol, derivatives of, A., 738.  
 2-Phenyldihydro-1:2:3:4-tetrazines, constitution of, and their derivatives, A., 172.  
 1-Phenyl-1:2-di(hydroxydiphenylmethyl)-cyclopropane, A., 385.  
 Phenyldi-*p*-hydroxycyclohexylmethane, and its derivatives, A., 53.  
 Phenyldi-2-hydroxy- $\alpha$ -naphthylmethane, *p*-chloro-, and its derivatives, A., 279.  
 1-Phenyl-1:2-di( $\alpha$ -hydroxy- $\alpha$ -phenylethyl)-cyclopropane, A., 385.  
 Phenyl dimethoxybenzyl ketones, and their oximes, A., 391.  
 $\beta$ -Phenyl- $\beta$ -dimethoxyphenylethylamines,  $\beta$ -hydroxy-, and their hydrochlorides, A., 392.  
 3-Phenyl-2-(3':4'-dimethoxystyryl)-1:4- $\alpha$ -naphthapyrone, A., 520.  
*N*-Phenyl-4-*p*-dimethylaminobenzylidenehomophthalimide, A., 624.  
 $\beta$ -Phenyl- $\delta$ -*p*-dimethylaminophenylbutan- $\beta$ -ol, A., 59.  
*r*- $\alpha$ -Phenyl- $\beta$ -*p*-dimethylaminophenylethan- $\alpha$ -ol,  $\beta$ -amino-, A., 746.  
 $\beta$ -Phenyl- $\beta$ -*p*-dimethylaminophenylethyl *p*-dimethylaminostyryl ketone, and its semicarbazone, A., 59.  
 $\beta$ -Phenyl- $\beta$ -*p*-dimethylaminophenylethyl methyl ketone, and its semicarbazone, A., 59.  
 $\alpha$ -Phenyl- $\eta$ -*p*-dimethylaminophenyl- $\Delta^{\alpha\gamma}$ -heptatrien- $\epsilon$ -one, and its salts, A., 60.  
 $\beta$ -Phenyl- $\gamma$ -*p*-dimethylaminophenylpropylamine, and its derivatives, A., 60.  
Phenyldi-2-dimethylamino-5-pyridylmethane, A., 167.  
4-Phenyl-2-dimethylaminostyrylquinazolinones, methiodides of, A., 282.  
4-Phenyl-2-*p*-dimethylaminostyrylquinoline, salts of, A., 282.  
Phenyl-*p*-dimethylaminotriphenylmethylamine, A., 733.  
Phenyl-*p*-dimethylaminotriphenylmethylcarbamide, A., 733.  
10-Phenyl-1:4-dimethylantrone, 5:8-dichloro-, A., 1135.  
Phenyldimethylarsine oxide, A., 528.  
*N*-Phenyldimethylcarbamide, *N*-*p*-nitro-, A., 597.  
Phenyldimethylcarbomethoxymethylammonium bromide, A., 605.

Phenyl-2:6-dimethyl-1:4-dihydropyridine-3:5-dicarboxylic acids, nitrohydroxy-, ethyl esters, A., 744.  
 2-Phenyl-7:8-dimethyldiphenimidines, and their salts, A., 524.  
*N*-Phenyl-4:4-dimethylhomophthalimide, A., 624.  
 1-Phenyl-4-dimethylhydantoin, *p*-nitro-, A., 598.  
 3-Phenyl-1:3-dimethylindolinone, and nitro-, A., 288.  
 $\alpha$ -Phenyl- $\beta\delta$ -dimethylpentane- $\alpha\beta$ -diol, A., 393.  
 3-Phenyl-2':4'-dimethylphthalaz-1-one, 4'-amino-, and 4'-nitro-, and their derivatives, A., 405.  
*N*-Phenyl-2':3'-dimethylphthalimidine, 4'-amino-, A., 405.  
 1-Phenyl-3:5-dimethylpyrazole-4-carboxylic acid, *p*-nitro-, ethyl ester, A., 514.  
 1-Phenyl-2:3-dimethyl-5-pyrazolone, manufacture of, (P.), B., 592.  
 Phenyldimethylstibine cyanobromide, A., 528.  
 4-Phenyl-4':4''-dimethyltriphenylmethane, A., 515.  
 3-Phenyl-1:7-dimethylxanthine, A., 525.  
*ms*-Phenyldinaphthopyran, *ms*-*p*-chloro-, A., 279.  
*ms*-Phenyldinaphthopyranol, *p*-chloro-, and its salts and derivatives, A., 279.  
*ms*-Phenyldinaphthopyrylium chloride ferri-chloride, *p*-chloro-, A., 279.  
 Phenyldi-*p*-nitrophenylguanidines, A., 376.  
 2-Phenyldiphenimide, and its salts, A., 524.  
 3-Phenyldiphenyl disulphide, 4-hydroxy-, A., 844.  
 $\alpha$ -Phenyl- $\beta$ -diphenylacrylic acid, and its amide, A., 1024.  
 $\alpha$ -Phenyl- $\beta$ -diphenyleneacrylophenone, A., 1024.  
 $\alpha$ -Phenyl- $\beta$ -diphenylenevinyl bromide, A., 1024.  
 Phenyl  $\beta\beta$ -diphenylstyryl ketone, *p*-bromo-, A., 616.  
 Phenyl-4-diphenylcarbinol, 4'-amino-, and its diacetyl derivative, A., 1028.  
*N*-Phenyl-*p*-diphenyldiphenylmethylamine, A., 1240.  
 $\beta$ -Phenyl- $\alpha$ -*o*-diphenylethane, A., 258.  
 Phenyl-*p*-diphenyl ketone, *p*-amino-, and its derivatives, A., 1125.  
 $p$ -chloro-, and its oxime, A., 853.  
 Phenyldiphenyl- $\alpha$ -naphthylcarbinols, and their ethyl ethers, A., 611.  
 Phenyldi-*n*-propylarsine, A., 1120.  
*N*-Phenyldi-*n*-propylcarbamide, *N*-*p*-nitro-, A., 597.  
 1-Phenyl-2:3:4:5-diisopropylideneglucosone, A., 147.  
 $\alpha$ -Phenyl- $\beta\beta$ -di-*p*-tolylacrylic acid, A., 848.  
 $\beta$ -Phenyl- $\alpha\alpha$ -di-*p*-tolylethylene, A., 848.  
*r*- $\beta$ -Phenyl- $\alpha\alpha$ -di-*p*-tolylpropan- $\alpha$ -ol,  $\beta$ -amino-, A., 382.  
 Phenyldi-*p*-tolylselenoninim salts, A., 181.  
 $\alpha$ -Phenyl- $\beta\beta$ -di-*p*-tolylvinyl bromide, A., 848.  
 $\gamma$ -Phenyldodecane,  $\alpha$ -bromo-, A., 847.  
 $\gamma$ -Phenyldodecan- $\alpha$ -ol, A., 847.  
 Phenyldodecic acids, and their esters, A., 847.  
 $s$ -Phenyl-*n*-dodecylcarbamide, A., 371.  
 $\beta$ -Phenyldodecylmalonic acid, ethyl ester, A., 847.  
*m*-Phenylenediacetic acid, diethyl ester, A., 1134.  
 Phenylenediacrylic acids, and their dimethyl esters, A., 1134.  
 $\alpha$ -Phenylenediamine, condensation of, with quinolinic acid, A., 864.

*p*-Phenylenediamine, catalytic reduction of, in presence of aldehydes and ketones, A., 154.  
 Phenylenediamines, effect of ultra-violet light on, B., 670.  
 equilibria of, with guaiacol, A., 697.  
 salts of, with organic acids, A., 263.  
 $p$ -toluenesulphonyl derivatives, A., 375.  
*m*-Phenylenediaminepyrazinedicarboxylein, A., 66.  
 $\epsilon\epsilon'$ -Phenylenedi-*n*-amyl alcohols, A., 1134.  
 $\beta\beta'$ -*m*-Phenylenediethyl alcohol, A., 1134.  
 $\zeta\zeta'$ -*m*-Phenylenedi-*n*-heptoic acid, derivatives of, A., 1134.  
 $\epsilon\epsilon'$ -*p*-Phenylenedi-*n*-hexoic acid, A., 1134.  
 $\zeta\zeta'$ -*m*-Phenylenedihexyl ketone, and its semicarbazone, A., 1134.  
 $o$ -Phenylenedi(phenylglyoxal), A., 396.  
 $\gamma\gamma'$ -Phenylenedipropyl alcohol, and their dibromides, A., 1134.  
 Phenylenedistibinic acids, A., 866.  
*m*-Phenylenedinitroamine, and its salts, A., 155.  
 Phenylene-*n*-valeric acids, diethyl esters, A., 1134.  
 Phenylethane,  $\alpha\beta$ -diamino-, diacetyl derivative, A., 256.  
 $\alpha$ -Phenylethane,  $\alpha\beta$ -diamino-, and its dihydrochloride, A., 284.  
 $\alpha\alpha$ -dichloro- $\alpha$ -*p*-bromo-, A., 374.  
 $\beta$ -Phenylethane,  $\alpha\beta$ -diamino-,  $\beta$ -benzoyl- $\alpha$ -acetyl derivative, A., 606.  
 Phenylethanes, effect of number of phenyl groups on hydrogenation of, A., 607.  
 $\beta$ -Phenylethoxyacetaldehyde, and its derivatives, A., 384.  
 Phenyl *p*-ethoxyanilinobenzyl ketone, A., 396.  
 6-Phenyl-1-*o*-ethoxy-2-methylbenzylmethylpiperidine, A., 524.  
 $\beta$ -Phenyl- $\beta$ -ethoxyphenylethylamines,  $\beta$ -hydroxy-, and their hydrochlorides, A., 391.  
 $\alpha$ -Phenylethyl alcohol, derivatives of, A., 54.  
 $\alpha$ -Phenylethyl alcohol,  $\beta$ -amino- $\alpha$ -3:4-dichloro-, and its hydrochloride, A., 1245.  
*l*- $\alpha$ -Phenylethyl chloride, A., 1027.  
 $\beta(\beta'$ -Phenylethyl)acetaldehyde, and its semicarbazone, A., 616.  
 $\beta(\beta'$ -Phenylethyl)allyl bromide, A., 616.  
 $\alpha$ -Phenylethylamine, preparation and resolution of, A., 154.  
 optical activity of, A., 51.  
 manufacture of trialkoxy-derivatives of, (P.), B., 241.  
 optically active, configuration of, A., 177.  
 $\beta$ -Phenylethylamine, detection of, A., 1150.  
 $\beta$ -Phenylethylamine,  $o$ -chloro-, picrate, and nitroso- $o$ -chloro-, A., 1242.  
 3-fluoro-, and its salts, A., 1130, 1247.  
 3-fluoro-4-hydroxy-. See Tyramine, *m*-fluoro-.  
 $\omega$ -Phenylethylamines, formation of, by reduction of nitrostyrenes, A., 506.  
 Phenylethylaminoacetic acid, methyl ester, and its dinitro-derivative, A., 170.  
 $\beta$ -(Phenylethylamino)ethanol, b.p. of, and its propionate hydrochloride, A., 846.  
 $\alpha$ -Phenyl- $\alpha$ -ethylbutaldehyde, and its semicarbazone, A., 392.  
 $\alpha$ -Phenyl- $\beta$ -ethylbutan- $\beta$ -ol, A., 392.  
 $\alpha$ -Phenyl- $\beta$ -ethyl- $\Delta^{\alpha}$ -butene, A., 152.  
 Phenylethylbutylamine, b.p. of, A., 846.  
 $\gamma$ -Phenyl- $\alpha$ -ethylbutyric acid, and its derivatives, A., 734.  
 $\gamma$ -Phenyl- $\alpha$ -ethylbutyronitrile,  $\alpha$ -amino-, derivatives of, A., 862.  
*N*-Phenyl-*N'*-ethylcarbamide, *N*-*p*-nitro-, A., 597.  
 $\beta$ -Phenylethylcarbimide, A., 60.

- Phenyl-4-ethyl-3:5-diketopyrazolidines, A., 1143.
- $\alpha$ -Phenylethyldimethylamines, *m*-hydroxy-, and their hydrochlorides and methylurethanes, A., 1244.
- Phenylethylene, nitro-derivatives, A., 730.
- Phenylethylenes, effect of number of phenyl groups on hydrogenation of, A., 607.
- Phenylethylenediamine, derivatives of, A., 256.
- Phenylethylenediamines, and their derivatives, A., 606.
- Phenylethylene glycol, dehydration of, with potassium hydroxide, A., 54.
- 5- $\beta$ -Phenylethyl-5-ethylhydantoin, A., 862.
- $\alpha$ -Phenylethyl ethyl ketone, and its semicarbazone, A., 392.
- $\beta$ -Phenylethylethylmalonic acid, and its ethyl ester, A., 734.
- 2- $\beta$ -Phenylethylcyclohexanol-2-carboxylic acid, ethyl ester, A., 1241.
- 2- $\beta$ -Phenylethylcyclohexanone, and its semicarbazone, A., 1241.
- 2- $\beta$ -Phenylethylcyclohexanone-2-carboxylic acid, ethyl ester, A., 1241.
- $\beta$ -Phenylethylhydrazine, and its derivatives, A., 942.
- Phenylethylidenebisdi-indone, A., 1252.
- $\beta$ -Phenylethylidenebisthiolacetic acid, A., 1235.
- 3-Phenyl-2-ethylindone, halogeno-derivatives of, A., 514.
- Phenylethylmalonylcarbamide, and amino-, and nitro-, partition coefficients of, A., 169.
- Phenylethylmethylamines, *mono*- and *di*-hydroxy-, hydrochlorides of, A., 1126.
- $\alpha$ -Phenylethylmethylamines, *m*-hydroxy-, and their salts, A., 1244.
- $\beta$ -Phenylethylmethylamine, 3:4-*di*hydroxy-, oxidation of, and its phenylhydrazone, A., 402.
- 5- $\beta$ -Phenylethyl-5-methylhydantoin, A., 862.
- Phenylethyl-1-phenyl-3-methylbarbituric acid, A., 283.
- Phenylethylisopropylamine, b.p. of, A., 846.
- Phenyl  $\alpha$ -ethylpropyl ketone, A., 368.
- Phenyl  $\alpha$ -ethyl-*n*-propyl ketone, and its semicarbazone, A., 392.
- $\alpha$ -Phenylethyl  $\alpha$ -propyl ketone, and its semicarbazone, A., 393.
- 1-( $\beta$ -Phenylethyl)-3-styrylbenzenes, 4:6-*di*-nitro-1- $\alpha$ -*di*bromo-, isomeric, A., 941.
- $\beta$ -Phenylethylsuccinic acid, derivatives of, A., 1131.
- Phenylethylsulphone, *o*-nitro-, A., 729.
- $\beta$ -Phenylethylthiocarbamide, A., 60.
- $\beta$ -Phenylethylvinylcarbinol, A., 616.
- 9-Phenylfluorene-2'-carboxylic acid, 9-hydroxy-, lactone of, A., 1032.
- 2-Phenyl-4-(3-fluoro-4'-ethoxybenzylidene)-5-oxazolone, A., 1247.
- 2-Phenyl-4-(3-fluoro-4'-methoxybenzylidene)-5-oxazolone, A., 1247.
- $\alpha$ -Phenyl-*d*-galactoside, A., 543.
- $\beta$ -Phenyl-*d*-glucoside 6-bromohydrin, and its triacetyl derivative, A., 543.
- 1-Phenyl-*d*-glucosone, and its derivatives, A., 147.
- $\beta$ -Phenylglutaconic acid,  $\alpha$ -cyano-, ethyl ester, sodium derivative, A., 1128.
- $\alpha$ -cyano- $\beta$ -*p*-hydroxy-, ethyl ester, and  $\beta$ -*p*-hydroxy-, and its derivatives, A., 512.
- $\beta$ -Phenylglutaric acid,  $\alpha$ -bromo- and  $\alpha$ -cyano- $\beta$ -*p*-hydroxy-, ethyl esters, and  $\beta$ -*p*-hydroxy-, and its ethyl ester, A., 512.
- $\alpha$ -cyano-, ethyl ester, A., 737.
- $\beta$ -Phenylglutaryl chloride, action of, on sodium azide, A., 1118.
- $\beta$ -Phenylglyceric acid,  $\alpha$ -cyano-*o*-chloro-, A., 1247.
- Phenylglycide, isomerisation of, A., 611.
- $\beta$ -Phenylglycidic acid,  $\alpha$ -cyano-*o*-chloro-, A., 1247.
- l*-Phenylglycine, equilibria of, with *d*- and *l*-phenylglycollic acids, A., 1205.
- Phenylglycines, configuration of, A., 1246.
- N*-Phenylglycineamide-*p*-arsin oxide, A., 1268.
- N*-Phenylglycineamide-*p*-thioarsinic acid, di-( $\beta$ -amino- $\beta$ -carboxyethyl) and di(glutathionyl) esters, A., 1268.
- N*-Phenylglycine-*p*-arsin oxide, methyl ester, A., 1268.
- d*-Phenylglycollic acid, equilibria of, with *d*- and *l*-tartaric acids, A., 1205.
- d*- and *l*-Phenylglycollic acids, equilibria of, with *l*-asparagine, *l*-chlorosuccinic acid, *l*-malic acid, and *l*-phenylglycine, A., 1205.
- Phenylglyoxal diacetate, A., 63.
- dimethylacetal, A., 59, 851.
- $\beta$ -Phenylglyoxime,  $\alpha$ -iodo-, and its dibenzoyl derivative, A., 1146.
- Phenylguanidine, *p*-amino-, preparation of, and its salts and dihydrate, A., 609.
- p*-hydroxy-, hydrochloride, A., 55.
- $\delta$ -Phenyl- $\beta$  $\gamma$ -heptadione, A., 515.
- $\gamma$ -Phenylheptane, and  $\alpha$ -bromo-, A., 846.
- d*- $\gamma$ -Phenylheptane, A., 1029.
- $\gamma$ -Phenylheptan- $\alpha$ -ol, A., 847.
- l*- $\gamma$ -Phenylheptan- $\alpha$ -ol, and its bromide, A., 1029.
- $\beta$ -Phenylheptoic acid, and its esters, A., 847.
- d*- $\beta$ -Phenylheptoic acid, A., 1029.
- Phenylhexadecanes,  $\alpha$ -bromo-, and  $\alpha$ -chloro-, A., 847.
- $\theta$ -Phenylhexadecan- $\alpha$ -ol, A., 847.
- Phenylhexadecanoic acids, and their esters, A., 847.
- $\eta$ -Phenylhexadecylmalonic acid, ethyl ester, A., 846.
- Phenylcyclohexane, synthesis and nitration of, A., 373.
- Phenylcyclohexanes, amino-, derivatives of, A., 1242.
- 1-Phenylcyclohexan-1-ol, 2-amino-, and its hydrochloride, A., 395.
- 2-Phenylcyclohexanone, and its derivatives, A., 395.
- Phenylcyclohexene, isomerisation of, A., 395.
- Phenylhexenes, *o*-hydroxy-, A., 610.
- c*-Phenylhexene  $\alpha$  $\beta$ -oxide, A., 394.
- d*- $\beta$ -Phenyl-*n*-hexoic acid, A., 1028.
- $\alpha$ -Phenyl-*n*-hexyl alcohol,  $\beta$ -amino-, and its hydrochloride, A., 395.
- Phenylhomocampholic acid, hydroxy-, identification of, A., 166.
- Phenylhydantoic acid, *p*-nitro-, and its ethyl ester, A., 598.
- 1-Phenylhydantoin, *p*-nitro-, A., 598.
- Phenylhydrazine, properties and reactions of, A., 377.
- m.p. of mixtures of, with acetic acid, A., 340.
- reaction of, with halogenoacetanilides, A., 50.
- with quinolinic anhydride, A., 862.
- Phenylhydrazine, *p*-nitro-, condensation of, with chloral hydrate and acetic acid, A., 932.
- 2:4-*di*nitro-, use of, in determination of carbonyl compounds, A., 411.
- $\beta$ -Phenylhydrazinoacetanilide, A., 50.
- Phenylhydrazones, action of, with condensing media, A., 1026.
- 3-Phenylhydrindene-1-carboxylic acid, methyl esters, isomeric, and ethyl ester, A., 270.
- Phenylhydrocotarnine, 1-2':4'-*di*hydroxy-. See Anhydrocotarninoresorcinol.
- Phenyl *p*-hydroxyanilinobenzyl ketone, A., 396.
- 2-Phenyl-3-hydroxybenzylcyclopropane-1-carboxylic acids, isomeric, and their derivatives, A., 1030.
- Phenyl-1-(*p*-hydroxy-*m*-carboxyphenyl)-methylpyrazoline, A., 283.
- Phenylhydroxylamine, *dicyano*-, and its salts and derivatives, A., 377.
- Phenyl  $\beta$ -hydroxy- $\alpha$ -methylvinyl ketone, derivatives of, A., 522.
- Phenyl 2-hydroxy- $\alpha$ -naphthyl ketazine, A., 264.
- Phenyl-2-hydroxy-1-naphthylsulphone, 2-nitro-, A., 156.
- 4'-thiol-, A., 735.
- $\beta$ -Phenyl- $\alpha$ -*p*-hydroxyphenylpropionic acid, *m*-bromo-, and its derivatives, A., 1047.
- 4-Phenyl-2-*p*-hydroxystyrylquinoline, salts of, A., 282.
- Phenyl-4-hydroxy-*m*-tolylsulphone, 2-nitro-, A., 156.
- 4-nitro-, A., 735.
- Phenyliminoquinone diazide, action of dilute sulphuric acid on, A., 747.
- 3-Phenylindene-1-carboxylic acid, methyl ester, A., 269.
- 4-Phenyl-2'-indolylvinylquinazoline methiodide, A., 282.
- 4-Phenyl-2'-indolylvinylquinoline methiodide, A., 282.
- Phenyl *p*-iodoanilinobenzyl ketone, A., 396.
- Phenyl*di*iodoarsines, *o*-iodo- and nitro-, A., 953.
- Phenyl  $\alpha$ -iodo- $\beta$  $\beta$ -diphenylethyl ketone, A., 616.
- N*-Phenyl-lutidonecarboxylic acid, A., 952.
- r*-Phenylmethoxyacetic acid, resolution of, A., 269.
- Phenyl *o*-methoxybenzyl ketone, and its semicarbazone, A., 390, 391.
- Phenyl *p*-methoxybenzyl ketone, A., 947.
- $\alpha$ -Phenyl- $\alpha$ -*m*-methoxyphenylethylene, iodo-hydrin, A., 390.
- 2-Phenyl-1-*p*-methoxyphenylethylene, 2-nitro-, A., 730.
- 4-Phenyl-1-*o*-methoxyphenyl-2-*p*-methoxyphenyl-3-methylpyrazopyrrolid-6-one, A., 171.
- Phenyl-*o*-methoxyphenylisooxazolines, A., 386.
- Phenyl methoxystyryl ketones, oximation of, and their derivatives, A., 386.
- 3-Phenyl-2-methoxystyryl-1:4- $\alpha$ -naphthapyrones, A., 520.
- 1-Phenyl-5-*p*-methoxystyrylpyrazole-3-acetphenylhydrazone, A., 748.
- 4-Phenyl-2-*p*-methoxystyrylquinoline ethiodide, A., 282.
- Phenyl-*N*-methylacetamidine hydrochloride, *p*-hydroxy-, A., 55.
- 5-Phenyl-10-methylacridinium hydroxide, activity coefficients of, A., 169.
- 3-Phenyl-1-methylalloxan 5-phenylhydraz-one, A., 1043.
- Phenylmethylamine, *o*-bromo-, picrate, and nitroso-*o*-bromo-, A., 1242.
- 2- $\beta$ -Phenylmethylaminoethylquinoline picrate, A., 167.
- $\beta$ -Phenyl- $\beta$ -methyl-*n*-amyl alcohol, A., 393.
- $\alpha$ -Phenyl- $\alpha$ -methylamyl methyl ether, A., 1251.

- $\epsilon$ -Phenyl- $\beta$ -methyl- $\alpha\beta$ -amylene oxide, A., 272.  
 9-Phenyl-2-methylantracene-1-carboxylic acid, and 10-hydroxy-, A., 274.  
 9-Phenyl-2-methyl-10-anthrone-1-carboxylic acid, and 9-hydroxy-, and its lactone, A., 274.  
 1-Phenyl-3-methylbarbituric acid, A., 283.  
 3-Phenyl-1-methylbarbituric acid, and its derivatives, A., 951.  
 and 5-amino-, derivatives of, and 5-bromo-, A., 1043.  
 3-Phenyl-1-methylbarbituric acid, 4-imino-, A., 525.  
 Phenyl *p*-methylbenzhydryl ketone. See *r-p*-Tolyldeoxybenzoin.  
 4'-Phenylmethylbenzophenones, A., 515.  
 $\alpha$ -Phenyl- $\gamma$ -methyl- $\beta$ -benzylbutan- $\beta$ -ol, A., 393.  
 Phenyl *p*-methylbenzyl ketone, and its derivatives, A., 390.  
 $\beta$ -Phenyl- $\alpha$ -methylbenzylpropionamides, and their urethanes, A., 1243.  
 $\alpha$ -Phenyl- $\alpha$ -methylbutaldehyde, and its semicarbazone, A., 392.  
 $\gamma$ -Phenyl- $\alpha$ -methylbutaldehyde, and its semicarbazone, A., 272.  
 $\alpha$ -Phenyl- $\beta$ -methylbutan- $\beta$ -ol, A., 393.  
 $\alpha$ -Phenyl- $\gamma$ -methyl- $\Delta^a$ -butene- $\beta\delta$ -dicarboxylic acid, A., 253.  
 $\alpha$ -Phenyl- $\gamma$ -methyl- $n$ -butyl alcohol,  $\beta$ -amino-, and its hydrochloride, A., 395.  
 $\gamma$ -Phenyl- $\beta$ -methyl- $n$ -butyl bromide, A., 278.  
 Phenylmethylbutylcarbinol, A., 1251.  
 $\alpha$ -Phenyl- $\beta$ -methyl- $\Delta^a$ -butylene, and its oxide, A., 392.  
 $\alpha$ -Phenyl- $\gamma$ -methyl- $\alpha\beta$ -butylene glycol, A., 392.  
 $\alpha$ -Phenyl- $\gamma$ -methyl- $\Delta^a$ -butylene oxide, A., 392.  
 $\delta$ -Phenyl- $\beta$ -methyl- $\alpha\beta$ -butylene oxide, A., 272.  
 $\alpha$ -Phenylmethyl isobutyl ketone, and its semicarbazone, A., 393.  
 $\gamma$ -Phenyl- $\alpha$ -methylbutyronitrile,  $\alpha$ -amino-, hydrochloride, A., 862.  
 Phenylmethylcarbinol, dipole moment of, A., 984.  
*dl*-Phenylmethylcarbinol chloroformate, A., 611.  
*l*-Phenylmethylcarbinol, formation of *d*- and *l*- $\alpha$ -chloroethylbenzenes from, A., 611.  
 2-Phenyl-1-methyl-3-carboline, and its salts, A., 289.  
 4-Phenyl-6-methylcoumarin, A., 620.  
 4-Phenyl-7-methylcoumarin, A., 858.  
 9-Phenyl-2-methyl-9:10-dihydroanthracene-1-carboxylic acid, and 10-chloro-9-hydroxy-, and 9:10-dihydroxy-, derivatives of, A., 274.  
 2-Phenyl-1-methyl-4:5-dihydrocarboline, A., 289.  
 9-Phenyl-2-methyl-9:10-dihydrocoeranthra-10:7'-dione, A., 274.  
 5-Phenyl-2-methyldihydroresorcinol, influence of methyl group in, A., 735.  
 $\epsilon$ -Phenyl- $\gamma$ -methylenepentan- $\alpha$ -ol, A., 1110.  
 Phenylmethylethylamine, b.p. of, A., 846.  
 Phenylmethylglyoxime peroxides, A., 272.  
 $\zeta$ -Phenyl- $\beta$ -methyl- $\Delta^{a\gamma\epsilon}$ -heptatrienoic acids, A., 600.  
 1-Phenyl-4-methylcyclohexadienes, *di*- and *tri*-chloro-, A., 736.  
 $\alpha$ -Phenyl- $\beta$ -methylhexane- $\alpha\beta$ -diol, A., 393.  
 1-Phenyl-4-methylcyclohexan-1-ol, 2-amino-, and its hydrochloride, A., 395.  
 2-Phenyl-5-methylcyclohexanone, and its semicarbazone, A., 395.  
 1-Phenyl-4-methylcyclohexene oxide, and its isomerisation, A., 395.  
 1-Phenyl-4-methyl- $\Delta^4$ -cyclohexen-3-one, 5-chloro-, A., 735.  
 $\alpha$ -Phenyl- $\alpha$ -methylhexoic acid, and its methyl ester, A., 1251.  
 $d$ - $\alpha$ -Phenyl- $\alpha$ -methylhexophenone. See Phenyl  $\alpha$ -phenyl- $\alpha$ -methylamyl ketone.  
 $\epsilon$ -Phenyl- $\beta$ -methyl- $\alpha\beta$ -hexylene oxide, A., 272.  
 1-Phenylmethylhydantoic acids, *p*-nitro-, A., 598.  
 Phenylmethylhydrazine, action of, on di-thio-acids, A., 51.  
 Phenylmethylhydrindene, and hydroxy-, A., 273.  
 3-Phenyl-2-methylhydrind-1-one, A., 507.  
 3-Phenyl-3-methylhydrindone, and 2-bromo-, A., 273.  
 2-Phenyl-3-methylindene, and its oxime, A., 273.  
 3-Phenyl-2-methylindone, derivatives of, A., 273.  
 Phenylmethylmalonylcarbamide, and amino-, and nitro-, partition coefficients of, A., 169.  
 3-Phenylmethyl- $\alpha$ -naphthapyrones, A., 520.  
 Phenylmethylnitrolic acids, chloro-, A., 272.  
 Phenylmethyloxadiazole, *p*-bromo-, A., 1146.  
 5-Phenyl-4-methyl-2-oxazolidone, A., 736.  
 $\delta$ -Phenyl- $\beta$ -methyl- $\Delta^{a\gamma}$ -pentadienoic acids, A., 600.  
 1-Phenyl-4-methylpentane-1-aldehyde, and its semicarbazone, A., 395.  
 $\alpha$ -Phenyl- $\beta$ -methylpentane- $\alpha\beta$ -diol, A., 393.  
 $\epsilon$ -Phenyl- $\gamma$ -methylpentane- $\alpha\gamma$ -diol, A., 1110.  
 $\alpha$ -Phenyl- $\beta$ -methylpentan- $\beta$ -ol, A., 393.  
 $\alpha$ -Phenyl- $\beta$ -methyl- $\Delta^a$ -pentene, and its oxide, A., 393.  
 $\epsilon$ -Phenyl- $\gamma$ -methyl- $\Delta^{\gamma}$ -penten- $\alpha$ -ol, A., 1110.  
 Phenyl 2-methylcyclopentyl ketone, and its derivatives, A., 50.  
 Phenylmethylphosphinic acid, butyl ester, A., 325.  
 3-Phenyl-4-methylphthalaz-1-one, 2'-chloro-4'-amino- and -4'-nitro-, and their derivatives, A., 284.  
 3-Phenyl-2'-methylphthalazones, 4'-amino-, and 4'-nitro-, A., 404.  
*N*-Phenyl-2'-methylphthalimidine, 4'-amino-, and its acetyl derivative, and 4'-hydroxy-, A., 405.  
*N*-Phenyl-3-methylphthalimidine, 2'-chloro-4'-amino-, and its acetyl derivative, A., 284.  
 $\beta$ -Phenyl- $\alpha$ -methylpropaldehyde, and its semicarbazone, A., 272.  
 1-Phenyl-2-methylcyclopropane, 1-cyano-, A., 739.  
*cis*- $\beta$ -Phenyl- $\alpha$ -methyl- $\Delta\beta$ -propene- $\alpha\gamma$ -dicarboxylic acid, and its ethyl ester, A., 1128.  
 $\beta$ -Phenyl- $\alpha$ -methylpropionic acid,  $\alpha$ -amino-, and its derivatives, A., 862.  
 $\alpha$ -Phenyl- $\beta$ -methylpropyl  $\beta$ -hydroxy- $\beta$ -phenylpropyl ether,  $\beta$ -hydroxy-, A., 363.  
 3-Phenyl-1-methyl-5-propylbarbituric acids, 5-bromo-, A., 1043.  
 $\gamma$ -Phenyl- $\beta$ -methyl- $\alpha\beta$ -propylene oxide, A., 272.  
*N*-Phenyl-*N'*-methyl-5-isopropylhydantoin, and bromo-, A., 1043.  
 1-Phenyl-5-methylpyrazoles, 4-hydroxy-1-*di*- and -*tri*-bromo- and -chloro-, and their derivatives, A., 283.  
 Phenyl-3-methylpyrazolone, 1-*m*-bromo-, and 4-nitro-*m*-bromo-*p*-nitro-, nitrate, A., 523.  
 6-Phenyl-5-methylpyridine; 2-hydroxy-, A., 522.  
 6-Phenyl-5-methyl-2-pyridone, 3-cyano-, A., 522.  
 6-Phenyl-5-methyl-2-pyridone-3-carboxylic acid, A., 522.  
 2-Phenyl-1-methylpyrrolidine, and its salts, A., 1141.  
 5-Phenyl-1-methyl-2-pyrrolidone, A., 1141.  
 4-Phenyl-2-methylquinazoline methiodide, A., 282.  
 Phenylmethylstibine salts, A., 528.  
 Phenyl- $\delta$ -methylisothiocarbamide, *p*-hydroxy-, hydriodide, A., 55.  
 3-Phenyl-1-methyluric acid, A., 756.  
 3-Phenyl-1-methyl- $\psi$ -uric acid, 4-imino-, A., 756.  
 $\alpha$ -Phenyl- $\alpha$ -methylvaleraldehyde, and its semicarbazone, A., 393.  
 $\alpha$ -Phenyl- $\alpha$ -methylvaleric acid, derivatives of, A., 393.  
 $\gamma$ -Phenyl- $\beta$ -methylvaleric acid, and its chloride, A., 278.  
 3-Phenyl-1-methylvioluric acid, A., 1043.  
 3-Phenyl-1-methylvioluric acid, 4-imino-, A., 525.  
 3-Phenyl-1-methylxanthine, A., 525.  
 1-Phenyl-naphthalenecarboxylic acid, A., 56.  
 2-Phenyl-1:4- $\beta$ -naphthapyrone, and 2-hydroxy-, and its acetyl derivative, A., 1140.  
 1-Phenyl- $\beta$ -naphthoisindazole-2'-aldehyde, and its anilino-derivative, A., 524.  
 1-Phenyl- $\beta$ -naphthoisindazole-2'-carboxylic acid, A., 524.  
 2-Phenylperinaphthothiazines, amino-, hydroxy-, and nitro-, A., 176.  
 Phenyl-naphthylamines, 2:4-dinitro- $\delta$ -chloro-, A., 259.  
 Phenyl- $\beta$ -naphthylaminesulphonic acids, *p*-amino-, derivatives of, A., 264.  
 Phenyl-nitroamines, *dinitro*-, A., 154.  
 Phenyl *p*-nitroanilinobenzyl ketone, A., 396.  
 Phenyl-nitro- $\beta$ -hydroxyethylamine (*trinitro*-, nitrate, (P.), B., 450).  
 Phenyl  $\beta$ -*o*-nitrophenyl- $\beta$ -hydroxyethyl ketone, and its benzoyl derivative, A., 625.  
 $\beta$ -Phenyl- $\alpha$ -*p*-nitrophenyl- $\delta$ -ketonic acids, isomeric, A., 269.  
 5-Phenyl-1-*p*-nitrophenyl-3-methylpyrazole, and its derivatives, A., 169.  
 $\epsilon$ -Phenyl-nonane,  $\alpha$ -bromo-, A., 847.  
 $\epsilon$ -Phenyl-nonan- $\alpha$ -ol, A., 847.  
 Phenyl-nonylcarbinol, A., 846.  
 $\alpha$ -Phenyl-nonylmaleic acid, ethyl ester, A., 846.  
 1-Phenyl-octadecic acid, and its *p*-bromophenacyl ester, A., 847.  
 $\delta$ -Phenyl-octane,  $\alpha$ -bromo-, A., 847.  
 $\delta$ -Phenyl-octan- $\alpha$ -ol, A., 846.  
 Phenyl-octylearbinol, A., 846.  
 $\delta$ -Phenyl-octylmalonic acid, ethyl ester, A., 847.  
 3-Phenyl-1:2:4-oxadiazole, 5-amino-, and its derivatives, A., 1267.  
 5-Phenyl-1:2:4-oxadiazole-3-carboxylic acid, and its salts, A., 1146.  
 Phenylloxen, and its dimeride, A., 63.  
 Phenylloximinooxazolone, A., 272.  
 $\epsilon$ -Phenyl-pentadecic acid, and its *p*-bromophenacyl ester, A., 847.  
 1-Phenylcyclopentane-1-aldehyde, and its semicarbazone, A., 395.  
 $\epsilon$ -Phenylpentene  $\alpha\beta$ -oxide, A., 394.  
 Phenylphenanthridine, 3-nitro-9-*o*-nitro-, A., 1041.  
*N'*-Phenyl-*N*-*o*-phenoxyphenyl-*N*-methylbenzamidine, and its hydrochloride, A., 1242.

- $\gamma$ -Phenyl- $\alpha$ -phenyl- $\beta$ -benzyl- $\Delta^{\alpha}$ - $\gamma$ -butenolactone,  $\gamma$ -chloro- $\gamma$ - $p$ -chloro-, and its derivatives, A., 1031.
- Phenyl  $\beta$ -phenyl- $\alpha$ -benzylethyl ketone phenylhydrazone, A., 1261.
- 2-Phenyl-3- $\alpha$ -phenylcinnamoylindone, A., 273.
- Phenyl  $\alpha$ -phenyl- $\alpha$ -methylamyl ketone, A., 1251.
- $d$ -Phenyl  $\beta$ -phenyl- $\alpha$ -methylethyl ketone, A., 1251.
- $\alpha$ -Phenyl  $\beta$ -phenylpropyl ketone, A., 496.
- Phenyl  $\beta$ -phenylstyryl ketone, and  $p$ -bromo-, anils of, A., 260.
- 2-Phenyl-4-phenylthiazole, 2- $p$ -amino-, A., 758.
- 1-Phenyl-4-phenyltriazene-1:2:3-triazole, and its bromo-derivative, A., 172.
- Phenylphosphinic acid, pyrocatechyl ester, A., 379.
- 3-Phenylphthalaz-1-one, 2'-chloro-4'-amino-, and its acetyl derivative, A., 284.
- $\alpha$ -Phenylphthalide-3'-carboxylic acid,  $p$ -hydroxy-, and its methyl ether, A., 1031.
- $N$ -Phenylphthalimidine, 2'-chloro-4'-amino-, and its acetyl derivative, A., 284.
- $N$ -Phenylphthalimide, and oximino-, A., 624.
- 1-Phenylpiperidine, preparation and dinitration of, A., 753.
- $\alpha$ -Phenyl- $\beta$ -piperidinopropane  $p$ -bromophenacyl bromide, A., 1239.
- Phenylpiperonylacetaldehyde, and its semicarbazone, A., 390.
- Phenyl piperonyl 1:2-diketone,  $p$ -chloro-, and its quinoxaline derivative, A., 1031.
- $\beta$ -Phenyl- $\alpha$ -piperonylethanol, A., 390.
- $\beta$ -Phenyl- $\alpha$ -piperonylethylene, and its oxide, A., 390.
- $\beta$ -Phenyl- $\alpha$ -piperonylethylene glycol, and its salts, A., 390.
- Phenyl piperonylmethyl ketone, and its semicarbazone, A., 390.
- 4-Phenyl-2-piperonyl-3-methylpyrazopyrrolid-6-one, A., 171.
- $\alpha$ -Phenylpropane,  $\alpha$ -chloro- $\beta$ -amino-, benzoyl derivative, A., 611.
- $\beta$ -Phenylpropane,  $\alpha\beta$ -diamino-, and its diacetyl derivative, A., 256.
- $\alpha$ - $\gamma$ -diamino-, diacetyl derivative, A., 256.
- $\gamma$ -Phenylpropane,  $\alpha$ -amino- $\alpha\beta$ -trioximino-, A., 272.
- 1-Phenylcyclopropane, 1-cyano-, A., 739.
- $dl$ - $\alpha$ -Phenylpropanes,  $\beta$ -amino-, A., 262.
- 1-Phenylcyclopropane-1-carboxylamide, A., 739.
- $\beta$ -Phenylpropane- $\alpha\beta$ -diol, A., 736.
- Phenylpropanolamine, 2:4-dihydroxy-, hydrochloride, A., 157.
- $\beta$ -Phenylpropionamide,  $\beta$ -amino-, benzoyl derivative, A., 284.
- $\alpha$ - $\beta$ -Phenylpropionamidophenyl esters, A., 1026.
- $\beta$ -Phenylpropion- $p$ -bromoanilide,  $\alpha\beta$ -dibromo-, A., 163.
- $\beta$ -Phenylpropionchlorophenylmethylamides, A., 1242.
- $\beta$ -Phenylpropionic acid,  $\alpha$ -aminophenyl ester, derivatives of, A., 1026.
- $p$ -phenylphenacyl ester, A., 745.
- $\alpha$ -Phenylpropionic acids,  $\alpha$ -amino-, derivatives of, A., 382.
- $\beta$ -Phenylpropionic acid,  $\alpha$ -amino- $\beta$ -fluoro-derivatives, and their copper salts, A., 1129.
- $\alpha$ -amino- $m$ -fluoro-, derivatives of, and  $m$ -fluoro-, A., 1247.
- $\alpha$ -amino- $\beta$ -3-fluoro-4-amino- and -4-nitro-, and 3-fluoro-, and its amide, A., 1130.
- $\beta$ -Phenylpropionic acid,  $\alpha\beta$ -dibromo-, condensation of, with benzene, A., 382.
- $\alpha\beta$ -dibromo- $\alpha$ -bromo-, -mono- and -dichloro-, - $\alpha$ -fluoro-, and - $\alpha$ -iodo-, A., 55.
- $dl$ - $\beta$ -Phenylpropionic acid,  $\alpha$ -diamino-, mono-acetyl derivative, derivatives of, A., 1118.
- $\alpha$ -amino- $\beta$ -3-fluoro-4-hydroxy-. See Tyrosine; fluoro-.
- $\alpha$ -Phenylpropionitrile, methylphenylhydrazide of, A., 288.
- $\alpha$ -Phenylpropionitrile,  $\alpha$ -amino-, acetyl derivative, A., 256.
- $\beta$ -Phenylpropion- $m$ -tolylmethylamide, A., 1242.
- 2- $\beta$ -Phenylpropionyl- $\alpha$ -naphthol, and its derivatives, A., 520.
- $\alpha$ -Phenyl- $n$ -propyl alcohol,  $\beta$ -amino- $\alpha$ -hydroxy-, manufacture of, (P.), B., 974.
- $\gamma$ -Phenylpropyl alcohol, A., 1110.
- $d$ - $\alpha$ -Phenylpropyl chloride, A., 1027.
- Phenylpropylacetylene, A., 142.
- $\alpha$ -Phenyl- $\beta$ -propylacetylene, A., 269.
- $\beta$ -( $\gamma$ -Phenylpropyl)acetaldehyde, and its semicarbazone, A., 616.
- $\beta$ -( $\gamma$ -Phenylpropyl)allyl bromide, A., 616.
- Phenyl  $\alpha$ -propylbutyl ketone, A., 368.
- $\alpha$ -Phenyl- $n$ -propyl butyl ketone, and its semicarbazone, A., 393.
- $N$ -Phenyl- $n$ -propylcarbamide,  $N$ - $p$ -nitro-, A., 597.
- $\alpha$ -Phenyl- $\Delta^{\alpha}$ -propylene oxide, A., 392.
- (+)- $\beta$ -Phenylpropylene  $\alpha\beta$ -oxide, A., 736.
- $\alpha$ -Phenylpropyl ethyl ketone, and its semicarbazone, A., 392.
- $d$ (+) and  $l$ (-)-3-Phenyl-5-propylhydantoins, A., 637.
- $\beta$ -Phenylpropylideneisomylamine, A., 253.
- $\beta$ -Phenylpropylidenebisdi-indone, A., 1252.
- 1-Phenylisopropylidene-glucosone, A., 147.
- Phenyl propyl ketone, 2:5-dihydroxy-, A., 648.
- $\gamma$ -Phenylpropylmalonic acid, diethyl ester, A., 1131.
- $\alpha$ -Phenyl- $n$ -propyl methyl ketone, and its semicarbazone, A., 393.
- $\gamma$ -Phenyl- $n$ -propyl methyl ketone, and its derivatives, A., 394.
- $\alpha$ -Phenyl- $n$ -propyl isopropyl ketone, and its semicarbazone, A., 393.
- $\gamma$ -Phenylpropylsuccinic acid, and its derivatives, A., 1131.
- Phenylpropylsulphones, nitro-, A., 729.
- Phenylpropylthiocarbimide, A., 60.
- $\gamma$ -Phenylpropylvinylcarbinol, A., 616.
- Phenylpyrazoles, amino-, diazotisation of, A., 169.
- 1-Phenylpyrazole-3-carboxylic acid, 4-hydroxy-, and 4-hydroxy-mono- and -dibromo- and -mono- and -di-chloro-, ethyl esters, and their derivatives, A., 1125.
- Phenylpyridine, 2:6-dihydroxy-4- $p$ -hydroxy-, and its derivatives, A., 513.
- 6-Phenyl-2-pyridone, 3-cyano-, and its derivatives, A., 521.
- 6-Phenyl-2-pyridone-3-carboxylic acid, A., 522.
- 2-Phenylpyrimidazole, 2:3:4'-dihydroxy-, and its salts, A., 170.
- Phenylpyruvic acid, oxidation of, in the organism, A., 876.
- ethyl ester, semicarbazone, A., 253.
- Phenylpyruvic acid,  $m$ -chloro-, A., 1034.
- 2-Phenylquinoline, 4'-amino-, derivatives of, A., 403.
- 2-Phenylquinoline-4-carboxylic acid. See Atophan and Cinchophen.
- 2-Phenylquinoline-4-carboxylic acid, mono- and di-bromo-3-hydroxy-2- $p$ -bromo-, 6-chloro-3-hydroxy-2- $p$ -chloro-, 6-iodo-3-hydroxy-2- $p$ -bromo- and -iodo-, 3-hydroxy-, and 3-hydroxy-2-bromo-, -2-chloro-, and -2-iodo-, A., 754.
- iodo-derivatives of, A., 1143.
- 2-Phenylquinoline-4'-carboxylic acid, derivatives of, A., 403.
- 2-Phenyl-5-styrylisatogen, 6-nitro-, A., 176.
- Phenyl styryl ketone, addition of sodium enol-alkylmalonic ester to, A., 252.
- Phenyl styryl ketones, synthesis of homologues and derivatives of, A., 388.
- 3-Phenyl-2-styryl-1:4- $\alpha$ -naphthapyrone, and its dibromide, A., 520.
- 5-Phenyl-3-styrylisooxazole, A., 387.
- Phenylsulphonyl bromide, 2:4:6-tribromo-, A., 844.
- $\zeta$ -Phenyltetradecane,  $\alpha$ -chloro-, A., 847.
- 1-Phenyltetradecoic acid, and its  $p$ -bromophenacyl ester, A., 847.
- $\zeta$ -Phenyltetradecylmalonic acid, ethyl ester, A., 846.
- 2-Phenyl-1:2:3:4-tetrahydronaphthalene, 2- $p$ -amino-, and its salts and derivatives, A., 1242.
- 1-Phenyl-1:2:3:4-tetrahydronaphthalene-3:4-dicarboxylic acid, A., 56.
- 3-Phenyltetrahydropthalazine-4-acetic acid, 1-hydroxy-3-2'-chloro-4'-amino-, and its acetyl derivative, A., 284.
- Phenyl tetramethoxytriphenylmethyl ketones, A., 391.
- 4-Phenyl-2:6- $pp'$ -tetramethyldiaminodistyrylpyrrium ferriehloride, A., 282.
- $p$ -Phenyltetraphenylmethane, 4-amino-, A., 1240.
- 1-Phenyltetrazole, 5-amino-, and its derivatives, and 5-bromo-, and 5-chloro-, A., 1044.
- 5-thiol-, salts of, A., 405.
- 4-Phenylthiazole, 2-thiol-, derivatives of, A., 68.
- $p$ -(4-Phenylthiazolyl)-2-phenylarsinic acid, A., 758.
- Phenylthioarsinic acid, aminohydroxy-derivatives, and their acetyl derivatives, and chloronitro-derivatives, esters of, A., 761.
- 4-amino-2-hydroxy-, acetyl derivative, di-( $\beta$ -amino- $\beta$ -carboxyethyl)- and diglutathionyl esters, A., 1268.
- Phenylthiocarbamide, sensory-thresholds for, A., 425.
- Phenylthiocarbamide,  $p$ -chloro-, A., 1044.
- 3-fluoro-, A., 154.
- Phenylthiocarbimide, reaction of, with phenols, in presence of aluminium chloride, A., 511.
- Phenylthiocarbimides, 4-fluoro-, 4-fluoro-3-nitro-, and 3-nitro-, A., 154.
- $N$ -Phenylthiodiphenylamine, sulphone from, A., 630.
- 4'-Phenylthiolbenzophenone, 4-amino-, and its derivatives, A., 1125.
- Phenyl  $\beta$ -thiol- $\beta$ -phenylethyl ketone, A., 745.
- Phenylthiourethanes, bromo-, mono- and di-chloro-, cyano-, fluoro-, iodo-, nitro-, and 3-nitro-4-fluoro-, A., 154.
- Phenyl- $p$ -tolylacetaldehyde, and its semicarbazone, A., 390.
- Phenyl- $p$ -tolylacetophenone. See Phenyl- $p$ -methylbenzhydrol ketone.
- $\beta$ -Phenyl- $\alpha$ - $p$ -tolylethanol, A., 390.
- $N'$ -Phenyl- $N$ - $\alpha$ -tolyl- $N'$ -ethylbenzamidine, and its picrate, A., 1242.
- $\beta$ -Phenyl- $\alpha$ - $p$ -tolylethylene, and its oxide, A., 390.

- $\alpha$ -Phenyl- $\beta$ -*p*-tolylethylene glycol, and its salts, A., 390.  
 2-Phenyl-3-*p*-tolylindone, A., 848.  
 $\alpha$ -Phenyl- $\beta$ -*p*-tolyl- $\delta$ -ketonic acids, isomeric, A., 158.  
 4-Phenyl-1-*m*-tolyl-2-*p*-methoxyphenyl-3-methylpyrazopyrrolid-6-one, A., 171.  
 Phenyltolyl-*N*-methylbenzamidines, and *o*-bromo-, and *o*-chloro-, and their picrates, A., 1242.  
 2-Phenyl-1-*p*-tolyl-5-methylindene, A., 382.  
 2-Phenyl-3-*p*-tolyl-6-methylindone, A., 848.  
 Phenyl-*p*-tolyl- $\beta$ -phenylacetylenylcarbinol, A., 736.  
 $\alpha$ -Phenyl- $\gamma$ -tolyl- $\beta$ -propylamines, and their salts and benzoyl derivatives, A., 1243.  
 1-Phenyl-1:2:3-triazole, 4-amino-, and its derivatives, and 4-hydroxy-, A., 172.  
 8-Phenyltridecane,  $\alpha$ -bromo-, A., 847.  
 8-Phenyltridecan- $\alpha$ -ol, A., 846.  
 8-Phenyltridecylmalonic acid, ethyl ester, A., 846.  
 3-Phenyl-1:2:3-trimethylindoleninium salts, A., 288.  
 2-Phenyl-3:5:5-trimethylmetoxazinetetrahydride, and its salts, A., 504.  
 2-Phenyl-1:3:4-trimethylpyrazopyrrolid-6-one, A., 171.  
 3-Phenyl-1:7:9-trimethyluric acid, A., 756.  
 4'-Phenyltriphenylmethane, 4-bromo-, and 4-chloro-, A., 1240.  
 $\gamma$ -Phenylundecane,  $\alpha$ -bromo-, A., 847.  
 $\gamma$ -Phenylundecan- $\alpha$ -ol, A., 847.  
 $\beta$ -Phenylundecic acid, and its esters, A., 847.  
 Phenyluracils, substituted, ultra-violet absorption spectra of, A., 320.  
 Phenylureidoglyoxime, A., 57.  
*N*-Phenylurethanodiphenylcarbinol, A., 1025.  
*N*-Phenylurethanophenylcarbinol, A., 1025.  
 3-Phenyluric acid, A., 756.  
 3-Phenyl- $\psi$ -uric acid, 4-imino-, A., 756.  
 $\alpha$ -Phenylvaleraldehyde, and its semicarbazone, A., 392.  
*d*- $\beta$ -Phenylvaleric acid, A., 1027.  
 $\gamma$ -Phenylvaleric acid,  $\alpha$ -cyano- $\beta$ -imino-, ethyl ester, A., 840.  
 $\beta$ -Phenyl- $\beta$ -veratrylethylamine,  $\beta$ -hydroxy-, A., 391.  
 Phenyl vinyl ketone, additive reactions of, A., 385.  
 3-Phenylxanthine, methylation of, A., 524.  
 $\beta$ -Phenyl-*d*-xyloside, A., 543.  
 Phillipsite, from Pacific Ocean, A., 1229.  
 Phlogopites, titanium in, A., 715.  
 Phloridzin, effect of, on absorption from the gastro-intestinal tract in white rats, A., 1061.  
 poisoning. See under Poisoning.  
*Phorbia brassicae*, control of, on radishes, B., 813.  
 Phosphagens, occurrence and body-distribution of, A., 532.  
 anaerobic synthesis of, in muscle extract, A., 188.  
 Phosphatemia, A., 293.  
 Phosphatase, specificity of, A., 92, 304.  
 effect of, in alcoholic and lactic fermentation, A., 1065.  
 hydrolysis of diarylphosphoric acids by, A., 1288.  
 action of, on substrates, A., 650.  
 influence of arsenic on, A., 882.  
 influence of thiol compounds on, A., 428.  
 in tuberculosis, A., 873, 874.  
 bone, action of, on blood-phosphates, A., 1288.  
 of bone and cartilage, A., 870.  
 from bran, A., 650.  
 Phosphatase, kidney, inhibition of, by phosphate, A., 882.  
 muscle, A., 967.  
 plasma, A., 882.  
 in tissues of clasmobranchs and teleosts, A., 193.  
 Phosphates. See under Phosphorus.  
 Phosphate rock, structure and composition of, A., 359.  
 efficiency of blast furnace for, B., 339.  
 treatment of, (P.), B., 146.  
 leaching of, (P.), B., 421, 599.  
 recovery of phosphate fines from washing of, (P.), B., 505.  
 decomposition of, with nitric acid, (P.), B., 421.  
 production of fertilisers from, (P.), B., 21.  
 availability of, as indicated by phosphorus assimilation by plants, B., 522.  
 of the Gaboon coast, A., 716.  
 determination of fluorine in, B., 62.  
 Phosphatides, A., 636, 958.  
 in fish, B., 366.  
 in milk and milk products, B., 1133.  
 content of, in normal and malignant tissues, A., 187.  
 buffering power of, A., 77.  
 effect of, on sugar excretion in phloridzinised dogs, A., 1284.  
 injected, fate of, A., 1160.  
 determination of, in tissues, A., 187.  
 Phospharyl thiochloride, A., 410.  
 Phosphides of heavy metals, A., 134.  
 Phosphine. See Phosphorus trihydride.  
 Phosphoesterases, A., 650.  
 Phospholipins, metabolism of. See under Metabolism.  
 in blood of children, A., 640.  
 determination of, in liquid cream, B., 1102.  
 Phosphonitrilic chlorides, A., 707.  
 Phosphonium compounds, with asymmetric phosphorus, A., 1268.  
 Phosphonium iodide, Raman spectrum of, A., 1189.  
 Phosphors, structure of, A., 321.  
 absorption spectra of, A., 898.  
*K*-absorption spectra of, A., 979.  
 alkaline-earth, emission of praseodymium in, A., 110, 321.  
 ultra-violet emission of, A., 560.  
 carbonate and oxide, discoloration and afterglow of, A., 445.  
 chromium, absorption and line emission spectra of, A., 983, 1076.  
 copper-zinc sulphide, change in dielectric constant of thin layers of, in different light, A., 110.  
 Lenard, band spectra of, A., 213.  
 sulphide, *K*-absorption constants in, A., 446.  
 Phosphor-bronze, strength of, at high temperatures, B., 1034.  
 Phosphorescent substances, A., 1216.  
 Phosphoric acid. See under Phosphorus.  
 Phosphorite, determination in, of phosphoric acid, A., 34.  
 Phosphorus, nuclear factors for, A., 439.  
 allotropy of, A., 115, 474.  
 manufacture of, in blast furnaces, (P.), B., 1119.  
 from calcium phosphate, (P.), B., 145.  
 from phosphate rock, (P.), B., 507.  
 and alumina, (P.), B., 22.  
 and its oxides, recovery of hydrogen, carbon monoxide, and, from phosphates, (P.), B., 982.  
 spectrum of, A., 207.  
 arc spectrum of, A., 551.  
 Phosphorus, band spectrum of, and nuclear spin, A., 667.  
 influence of bromine and chlorine on glow of, A., 483.  
 influence of sulphur dioxide on glow of, A., 445.  
 equilibria of iron, nickel, and, A., 221.  
 vapour, oxidation of, at low pressures, A., 701.  
 in presence of platinum and tungsten, A., 477.  
 in blood and urine, A., 956.  
 red, history of, A., 1106.  
 white, effect of carbon tetrachloride and phosphoryl chloride on oxygen pressure for luminescence of, A., 1076.  
 Phosphorus alloys with copper and silver, A., 1196.  
 Phosphorus compounds, behaviour of, in autolysis of organs, A., 882.  
 in diet, A., 642.  
 treatment of rickets with, A., 642.  
 Phosphorus pentabromide, reaction of, with ethyl oxalate, A., 1233.  
 bromochlorides, A., 1218.  
 trichloride, dielectric constant of, A., 676.  
 effect of alkali and alkaline-earth sulphides on reaction of sulphur with, A., 347.  
 pentachloride, reactions of, with fluorides, A., 1100.  
 chlorides, dielectric constants of, A., 322.  
 trihydride (*phosphine*), photochemical decomposition of, A., 479.  
 oxidation of, A., 1218.  
 additive compound of, with boron trichloride, A., 1218.  
 suboxide, A., 484.  
 trioxide, vapour tension of, A., 14.  
 action of water on, A., 483.  
 pentoxide, manufacture of, (P.), B., 420.  
 molecular volume of, A., 1190.  
 crystal structure of, A., 217.  
 equilibrium of, with calcium oxide, A., 1204.  
 determination of, by reduction of molybdenum precipitate with amalgams, B., 545.  
 in phosphates, B., 598.  
 sulphochloride, manufacture of, (P.), B., 341.  
 Hypophosphorous acid, determination of, A., 135, 136.  
 iodometrically, A., 242.  
 Phosphorous acid, oxidation of, by water in presence of colloidal metals, A., 578.  
 determination of, A., 135, 136.  
 iodometrically, A., 242.  
 Phosphoric acid and its salts, preparation of, B., 259.  
 manufacture of, (P.), B., 420, 933.  
 and its salts, (P.), B., 505, 934.  
 by volatilisation process, B., 1118.  
 volatilisation of phosphorus and potash for, (P.), B., 504.  
 thermal production of, B., 677.  
 production of hydrogen and, (P.), B., 884.  
 concentration of, (P.), B., 102.  
 by submerged combustion, B., 20.  
 molecular volume of, A., 1190.  
 equilibria of, with barium hydroxide, carbon dioxide, and water, A., 229.  
 with calcium hydroxide, carbon dioxide, and water, A., 229.  
 prevention of corrosion of iron by, (P.), B., 188.  
 action of, on alloys, B., 185.  
 compounds of, with calcium oxide, A., 469.

**Phosphorus:—**

**Phosphoric acid**, manufacture of esters of, (P.), B., 928.  
 crude, prepared by sulphuric acid process, analyses of, B., 1118.  
 detection of, in presence of arsenic and arsenious acids, A., 710.  
 determination of, A., 136.  
   as ammonium phosphomolybdate, A., 34.  
   with benzidine, B., 1027.  
   colorimetrically, A., 487, 825.  
   microchemically, by the ceruleo-molybdate method, A., 34.  
   with strychnine molybdate, A., 354, 587, 1102.  
   in eggs, B., 160.  
   in fertilisers, B., 276.  
   in phosphate fertilisers, B., 567.  
   in phosphorites and apatites, A., 34.  
   in presence of pyrophosphoric acid, A., 1221.  
   in soils, B., 854.  
   separation of, from calcium and magnesium, with ammonium molybdate, A., 1102.  
**Phosphates**, recovery of, (P.), B., 935.  
   from nitrogenous waste materials, (P.), B., 464.  
   composition, solubility, assimilability, and analysis of, B., 781.  
   solubility of, in ammonium citrate, B., 101.  
   in citric acid and neutral ammonium citrate solutions, B., 598.  
   mixing of ammonium nitrate and, B., 101.  
   coagulation of precipitates in solutions containing, (P.), B., 980.  
   reduction of, A., 484.  
   role of, in oxidation, A., 577.  
   fertilising action of, from year to year, B., 37.  
   of the central chernozem region, flotation of, B., 504.  
   in the Cioclovina caves, A., 927.  
   in ancient sediments, A., 715.  
   in U.S.S.R., B., 504.  
   acid, production of, (P.), B., 980.  
   natural, fluorine in, B., 382.  
   raw, decomposition of, (P.), B., 980.  
   titanium in, B., 677.  
   slightly soluble, buffer effect of, A., 696.  
   precipitation of, as bismuth phosphate, A., 34.  
   elimination of, as lead phosphate in qualitative analysis, A., 136.  
   detection of, A., 1102.  
   determination of, mercurimetrically, A., 1010.  
   in biological materials, A., 825.  
   in water, A., 242.  
   in boiler water, B., 963.  
**Hexametaphosphates**, A., 483.  
**Hypophosphoric acid**, determination of, A., 136.  
   argentometrically, in presence of phosphates or phosphites, A., 135.  
   electrometrically, A., 710.  
**Metaphosphoric acid**, molecular volume of, A., 1190.  
**Pyrophosphoric acid**, velocity of hydrolysis of, A., 576, 816.  
**Fluorophosphoric acid**, preparation of, A., 132.  
   salts of, A., 1233.  
**Thiophosphoric acid**, manufacture of esters of, (P.), B., 928.  
**Phosphorus organic compounds**, in plants, A., 1181.

**Phosphorus organic compounds**, in plants and animals, A., 1203.  
 determination of, in blood, A., 1053.  
**Phosphoric acids**, esters, A., 364.  
   viscosity of, A., 454.  
   enzymic hydrolysis of, A., 364.  
**Pyrophosphorous acid**, esters, A., 364.  
**Phosphorus detection and determination:—**  
   detection of, in plant cells, A., 205.  
   determination of, colorimetrically, A., 786.  
   volumetrically, A., 438.  
   in blood, A., 531.  
   in blood-serum, A., 75.  
   in caseinogen, A., 533.  
   in coal and coke, B., 582.  
   in coke, B., 709.  
   in fats, B., 1125.  
   in iron and its alloys, working up of filtrate from, B., 347.  
   in phosphate fertilisers, B., 124.  
   in plant materials, A., 550.  
   in seeds, A., 978.  
   in soil extracts, B., 362.  
   in tissue extracts, A., 102.  
**Phosphoryl chloride**, thio-, use of, in preparation of triaryl thiophosphates, A., 416.  
**Photoanisotropy**, A., 918, 1214.  
*Photobacillus radians*, effect of alkali halides on production of light by, A., 652.  
**Photochemical processes**, quantum mechanics of, A., 28.  
   primary, A., 706.  
   reactions, A., 130.  
   extinction of fluorescence and retardation of, A., 109.  
   temperature coefficients of, A., 1005.  
   influence of stirring on, A., 1097.  
   using photo-galvanic elements, A., 821.  
   triatomic halogen molecules in, A., 348.  
   studies, A., 349, 1214.  
**Photochemistry**, technique in, A., 827.  
   application of band spectroscopy in, A., 237.  
   organic, A., 706.  
**Photochemotherapy**, A., 424.  
**Photo-conductors**, catalysis in, A., 560.  
**Photodichroism**, A., 918.  
**Photo-electric absorption** in hydrogen-like atoms, A., 553.  
   apparatus, (P.), B., 268.  
   for transmission of pictures, (P.), B., 152.  
   cells. See Cells, photo-electric.  
   effect, A., 1189.  
   and field effect, A., 105.  
   influence of electrolytes on, A., 126.  
   of liquids, A., 793.  
   in semi-conductors, A., 321.  
   crystal and unidirectional layer, A., 898.  
   unidirectional layer, A., 898.  
   emission, Fowler's theory of, A., 209.  
   phenomena, A., 898.  
   potential. See under Potential.  
   tubes, (P.), B., 611.  
**Photo-electrons**, origin of, A., 788.  
   and negative ions, A., 209.  
   scattered, distribution of, A., 788.  
**Photographs**, colour, production of, (P.), B., 961.  
   by contact printing, (P.), B., 962.  
   indirect reproduction of, (P.), B., 1009.  
**X-ray**, production of, (P.), B., 207, 752.  
   apparatus for, (P.), B., 162.  
   supports for carrying plates or films for, (P.), B., 241.  
**X-ray powder**, camera for, A., 36.

**Photographic action of slow electrons**, A., 821.  
 azo-copying paper, development of, (P.), B., 482.  
 bleaching-out, (P.), B., 704.  
 colloid reliefs, (P.), B., 449.  
 desensitisers, protective action of, to photo-biological processes, A., 1062.  
 designs for textiles, (P.), B., 450.  
 developers, electrolytic oxidation of, B., 129.  
 developing solutions, keeping properties of, B., 1056.  
 development, (P.), B., 369.  
 development and developers, B., 751.  
 emulsions, manufacture of, (P.), B., 1056.  
   treatment of, (P.), B., 913.  
   graininess of, B., 865.  
   silver and hydrogen-ion concentrations in, A., 581.  
   equilibrium between silver ions and gelatin in, A., 130.  
   sensitisation of, (P.), B., 1009, 1105.  
   by dyes, A., 1214.  
   simultaneous development and desensitisation of, by sodium hyposulphite, B., 751.  
   for metal films, (P.), B., 449.  
   silver bromide, grainless, sensitivity of, to  $\alpha$ -particles, A., 1215.  
   silver halide, simultaneous development of, on different supports, (P.), B., 1009.  
   grain size in, A., 1214.  
   determination in, of silver halide and soluble bromide, B., 864.  
 emulsions and images, determination in, of silver, B., 577.  
 films, (P.), B., 322, 369, 786, 1009.  
 ink for, (P.), B., 818.  
 production of gelatin reliefs on, (P.), B., 658.  
 cellulose ester, (P.), B., 449.  
   manufacture of, (P.), B., 141.  
 cellulose nitrate, scrap, reclaiming of, (P.), B., 49.  
 colour, (P.), B., 369.  
   manufacture of, (P.), B., 786.  
   Spicer-Dufay process for, B., 401.  
   free from halation, (P.), B., 449.  
   lenticular, production of, (P.), B., 752.  
   copying images on, (P.), B., 786.  
   non-inflammable, (P.), B., 1009.  
   scrap, reclamation of, (P.), B., 1056.  
 films and plates, (P.), B., 913.  
   anti-halation layers for, (P.), B., 704, 751, 1056.  
 film-packs, casings for, (P.), B., 482.  
 film rolls, protective paper for daylight loading of, (P.), B., 786.  
 fixing solutions, recovery of silver from, (P.), B., 898.  
 hypersensitisation, A., 581.  
 images, production of, (P.), B., 401, 449, 752.  
   by projection printing, (P.), B., 528.  
   production of colloid reliefs in, (P.), B., 528.  
   coloured, production of, (P.), B., 752.  
   dyed, correction of colour transparency of, (P.), B., 401.  
 latent, A., 1214.  
   equation for formation of, A., 1006.  
   micellar theory of, A., 29.  
   photo-electric theory of, A., 821.  
   silver nucleus theory of, A., 821.  
   spontaneous growth of, between exposure and development, B., 129.  
   destruction of, by monochromatic light, A., 1097.



Photographic images, latent, for physical development, A., 821, 1098.  
 on bare glass, B., 449.  
 multi-colour, production of, (P.), B., 704.  
 reversal, second development of, B., 129.  
 intensity, units of, A., 29.  
 layers, colour-changing, production of, (P.), B., 752.  
 coloured colloidal, production of, (P.), B., 751.  
 diazo-type, manufacture of, (P.), B., 368.  
 light-sensitive, reversal development of, (P.), B., 1138.  
 materials, manufacture of, (P.), B., 1009.  
 light-sensitive, (P.), B., 624, 961.  
 manufacture of, (P.), B., 1105, 1137.  
 negatives, standardisation of materials for, B., 865.  
 printing of coloured images from, on colour screens, (P.), B., 752.  
 fine-grained, production of, by development, B., 162.  
 paper, apparatus for development of, (P.), B., 752.  
 with ammonia, (P.), B., 1057.  
 black-line, manufacture of, (P.), B., 80.  
 paper, plates, and films, packing of, (P.), B., 786.  
 pictures, coloured, production of, (P.), B., 482, 624, 704.  
 multi-colour, production of, (P.), B., 961.  
 subtractive, preparation of, (P.), B., 818.  
 plates, manufacture of, (P.), B., 914.  
 sensitisation of, to wavelengths below 2500 Å., B., 1105.  
 antagonism of effect of radiations on, A., 581.  
 influence of inclination of rays on sensitivity of, B., 913.  
 effects of cathode and X-rays on, A., 29.  
 packing of, (P.), B., 288, 624, 962.  
 for use in astronomy and spectroscopy, B., 162, 657.  
 doubly-refracting, retardation of, in the ultra-violet, A., 678.  
 infra-red sensitised, increase in sensitivity of, by warming during exposure, B., 162.  
 panchromatic, B., 162.  
 action of hydrogen peroxide and of silver ions on, A., 581.  
 Schumann, production of, B., 1104.  
 prints, apparatus for production of, (P.), B., 1138.  
 coloured, (P.), B., 482.  
 production of, (P.), B., 369.  
 diazo-type, on films, after-treatment of, (P.), B., 322.  
 printing, (P.), B., 322, 1057.  
 by optical projection, (P.), B., 369.  
 for book illustrations, etc., B., 528.  
 colour, B., 1056; (P.), B., 913.  
 Ives' polychrome process for, B., 865.  
 multi-colour, (P.), B., 401.  
 printing paper, determination in, of silver halides, B., 1009.  
 printing plates, manufacture of, (P.), B., 1056.  
 processes in alkali and silver salts, A., 985.  
 records, light source of production of, (P.), B., 657.  
 intensification of, by exposure to weak light before development, B., 1137.  
 reversal processes, (P.), B., 449, 962.

Photographic screens, fireproof, (P.), B., 1057.  
 polychromatic, production of, (P.), B., 704.  
 projector, (P.), B., 1056.  
 sensitisation, A., 479.  
 with desensitisers, B., 162.  
 sensitisers, (P.), B., 913.  
 manufacture of, (P.), B., 80.  
 manufacture of dyes for use as, (P.), B., 57.  
 colour, spectrochemistry of, A., 706.  
 optical, A., 349.  
 sensitisers and desensitisers, manufacture of, (P.), B., 961.  
 sensitivity, A., 29; B., 401.  
 with different light sources, B., 207.  
 Photography, (P.), B., 81, 129.  
 effect of pressure in, A., 581.  
 antihalation dyes for, (P.), B., 301.  
 flashlights for, (P.), B., 129.  
 light source for, (P.), B., 450.  
 uranium intensifiers for, (P.), B., 288.  
 colour, (P.), B., 81, 129, 162, 208, 241, 624, 658, 786, 961.  
 printing in, (P.), B., 369.  
 projection of lenticular film copies in, (P.), B., 49.  
 suppression of moiré effects in, (P.), B., 752.  
 production of multicolour records in, (P.), B., 162.  
 reproduction of multiple images in, (P.), B., 401.  
 movable camera-back for, (P.), B., 401.  
 multi-colour screens for use in, (P.), B., 49, 962.  
 bi-pack and tri-pack, (P.), B., 528.  
 infra-red, A., 444.  
 multi-colour, (P.), B., 704.  
 positive, by Herschel effect, B., 49.  
 three-colour, production of partial-colour sensations for, (P.), B., 704.  
 two-colour, B., 657.  
 Photomechanical printing surfaces, preparation of, (P.), B., 80.  
 Photometers, (P.), B., 657.  
 photo-electric, A., 245.  
 Pulfrich, heterochrome determinations with, A., 1013.  
 Photometry, applications of, in rubber technique, B., 688.  
 heterochromatic, A., 668.  
 Photomicrographs, apparatus for, A., 1225.  
 Photons, penetration of atoms by, A., 1187.  
 spin of, A., 5, 107, 211.  
 Photohoresis, A., 338.  
 Photopyridine, A., 1149.  
 Photo-santoninic acid, refractive indices of, A., 214.  
 Photosensitisation, dyes for, (P.), B., 673, 765.  
 Photosynthesis with intermittent light, A., 548.  
 in tropical sunlight, A., 480, 706.  
 initial sugars in, A., 1295.  
*in vitro*, A., 582.  
*Photurus pennsylvanica*. See Fireflies.  
 Phosphorides, and their derivatives, A., 659.  
 Phthalamide-4-arsinic acid, A., 180.  
 Phthalanilic acid, methyl ester, and its nitroso-derivative, A., 512.  
 Phthalazine, 1:4-dibromo-, and its reaction with sodium azide, and 1-bromo-4-hydroxy-, A., 1266.  
 Phthalic acid, copper salt, attempted formation of fluoran from, A., 269.  
 creatinine salt, A., 1041.  
 β-aminoethyl ethyl ester, and its salts, A., 288.

Phthalic acid, di-2:6-dibromo-, and di-2:6-dichloro-phenyl esters, A., 613.  
 furfuryl hydrogen ester, A., 1140.  
 d-β-octyl hydrogen ester, and its salts, and methyl ester, optical rotation of, A., 323.  
 and tetrachloro-, and 4-nitro-, p-phenyl-phenacyl esters, A., 745.  
 Phthalic anhydride, reduction of, electrolytically, A., 739.  
 peri-condensation of, A., 1130.  
 condensation of, with benzidine, A., 171.  
 with glycerol, A., 945.  
 production of halogen derivatives of, (P.), B., 138.  
 crude, refining of, (P.), B., 301.  
 Phthalidecarboxylanilide, A., 262.  
 Phthalimide, reduction of, electrolytically, A., 849.  
 Phthalimide, 3-nitro-, use of, in identification of halogen organic compounds, and its potassium derivative, A., 1231.  
 Phthalimide-4-arsinic acid, A., 180.  
 Phthalimidoacetate, A., 758.  
 2'-Phthalimido-2-acetamidodiphenyl, A., 508.  
 δ-Phthalimido-α-acetyl-β-methylvaleric acid, ethyl ester, A., 287.  
 α-Phthalimido-n-butane, μ-bromo-, and μ-iodo-, A., 1118.  
 ω-Phthalimido-1:4-dimethylnaphthalene, A., 941.  
 2'-Phthalimidodiphenyl, 2-iodo-, A., 508.  
 η-Phthalimido-n-heptane, α-bromo-, A., 1238.  
 ζ-Phthalimido-n-hexane, α-bromo-, A., 1238.  
 δ-Phthalimido-α-keto-β-methylvaleric acid, ethyl ester, p-ethoxyphenylhydrazone, A., 287.  
 γ-Phthalimido-α-methylbutyric acid, A., 288.  
 α-Phthalimido-Δ<sup>7</sup>-pentaenoic acid, γδ-dihydroxy-, dibenzoyl derivative, A., 863.  
 Phthalom-bromobenzylimide, A., 384.  
 Phthalom-γ-bromobutylimide, A., 287.  
 Phthalom-m-iodobenzylimide, A., 384.  
 Phthalone-imides, and their derivatives, A., 168.  
 Phthalonimide, derivatives of, A., 624.  
 Phthalon-naphthylimides, and their derivatives, A., 624.  
 Phthalophenylimide, and its derivatives, A., 624.  
 Phthalon-p-tolylimide, and its derivatives, A., 624.  
 Phthalom-β-piperonyl ethylimide, A., 1262.  
 o-Phthaloyl chloride, reaction of, with β-naphthyl and β-thionaphthyl methyl ethers, A., 842.  
 2-Phthaloyl-3:4:5:6-dibenzoylene-Δ<sup>3:5</sup>-cyclohexadiene, A., 747.  
 2:3-Phthaloylphenanthraquinone, A., 1137.  
 Phthalolpyrenes, manufacture of, (P.), B., 498.  
 o-Phthaloyl chloride, action of hydrogen selenide on, A., 849.  
 selenide, A., 849.  
 Phthalylbenzidine, configuration of, A., 609.  
 α-Phthalylhistidine, and its derivatives, A., 863.  
 1:8-Phthalyl-dihydroxynaphthalenes, A., 1130.  
 Phthalynaphthalene, and 2-chloro-, and their derivatives, A., 1130.  
 1:8-Phthalynaphthalene-3-carboxylic acid, 2-hydroxy-, A., 1130.  
 1:8-Phthalyl-β-naphthyl methyl ether, A., 842.  
 Phthisis. See Tuberculosis.  
 Phyllobombycin, A., 659.

- Phyllocyanic acid, copper salt, A., 286.  
 Phylloerythrin, synthesis of, A., 1045.  
 Phyllomerol, and its derivatives, A., 1258.  
 Phyllomeronic acid, and its derivatives, A., 1258.  
*Phymatotrichum*. See Root rot.  
 Physical constants, A., 453.  
 Physical constants, relations between, A., 329, 444, 565, 673.  
 Physical observations, limiting values of, A., 1081.  
 Physico-chemical constants, determination of, at high temperatures, A., 566.  
 Physin, A., 1174.  
 Physiological action and chemical constitution, A., 645, 1061, 1166, 1277.  
 fluids, human, spectrography of, A., 412.  
 solutions, depression of freezing point of, A., 539.  
 Physiologically active substances, purification of, (P.), B., 48, 657.  
 Physostigmine. See Eserine.  
 Phytase, A., 304.  
 Phytin, detection of, colorimetrically, A., 1270.  
 Phytinic acid, salts, detection of, A., 1270.  
 Phytochemistry, A., 975.  
 Phytosterols, dehydrogenation of, with selenium, A., 1245.  
 esters, physiological action of, A., 646.  
 detection of, colorimetrically, A., 1270.  
 Phytocanthin, A., 1257.  
 Pickles, manufacture of, (P.), B., 1053.  
 Pickling brine, rôle of bacteria of halophiles of, B., 285.  
 $\alpha$ -Picoline, electrochemical oxidation of, A., 622.  
 $\alpha$ -Picoline, 5-amino-, 5-bromo-, and 4-iodo-, and their derivatives, A., 401.  
 $\alpha$ -Picolinic acid, *mono*-, *di*-, and *tri*-chloro-, 5-chloro-4-iodo-, 5-hydroxy-, and 5-iodo-, and their derivatives, A., 401.  
 Picric acid, manufacture of, (P.), B., 763.  
 solubility of, in mixed solvents, A., 458.  
 action of, on salt films, A., 569.  
 salts, physical properties of molten mixtures of, A., 800.  
 decomposition of, by wool, A., 1182.  
 alkylammonium salts, conductivity of, in aqueous solution, A., 1092.  
 metallic salts, temperature measurements in dehydration and explosion of, A., 340.  
 identification of, by formation of picrolonic acid, A., 291.  
 Picrolonic acid, salts, decomposition of, by wool, A., 1182.  
 alkaline-earth salts, detection of, A., 1051.  
 Picrolonic acid, *m*-bromo-, and its use in analysis of bases, A., 523.  
*apo*Picropodophyllin acid, A., 618.  
 Picropodophyllin, constitution of, A., 1137.  
 and its acetyl derivative, A., 618.  
 Picrotoxin as antidote to barbituric acid hypnotics, A., 540.  
 Picryl chloride, compound of, with benzene, A., 697.  
 use of, in determination of aromatic amines, A., 1149.  
 Pictures, microchemical examination of, B., 153.  
 Piezo-electric devices, quartz, (P.), B., 28.  
 properties, A., 904.  
 Piezo-electricity, A., 218.  
 Pigs, treatment of maize and tankage for, B., 160.  
 cooked maize meal for feeding of, B., 958.  
 oats for feeding of, B., 959.  
 Pigs, body-fat of, A., 189, 637.  
 growing, metabolism and energy exchange in, A., 539.  
 Pigeon guano. See under Guano.  
 Pigments, determination of particle size of, B., 356.  
 surface and interstices of particles of, B., 687.  
 fine grinding of, (P.), B., 405.  
 determination of fineness of with the turbidimeter, B., 613.  
 oil absorption of, B., 117.  
 oil absorption and acid value of, B., 195.  
 adsorption of paint driers by, B., 153.  
 vehicles for, B., 271.  
 mixing of, for paints, (P.), B., 852.  
 relations between paint media and, B., 613.  
 in hair, Dopa reaction applied to, A., 766.  
 containing aluminium oxide, structure of, B., 314.  
 black, production of, (P.), B., 562.  
 and corrosion, B., 561.  
 brown, manufacture of, from sludge of titanium, (P.), B., 807.  
 cadmium red, analysis of, B., 234.  
 calcium sulphate-titanium oxide, manufacture of, (P.), B., 272.  
 carbon, production of, from hydrocarbon oils, (P.), B., 220.  
 ceramic, manufacture of, (P.), B., 997.  
 chrome, production of, (P.), B., 650.  
 co-precipitated and "extended," comparison of, B., 31.  
 fine, production of, (P.), B., 879.  
 average particle size of, B., 613.  
 inorganic, B., 436.  
 iron oxide, manufacture of, (P.), B., 878, 1041.  
 "gas red," B., 851.  
 lead, "passifying" action of, B., 649.  
 lead chromate, B., 117.  
 effect of  $p_H$  on colour of, B., 356.  
 lead- and mixed chrome, hiding power and drying rates of, B., 561.  
 non-agglomerating, (P.), B., 807.  
 Prussian blue, bronzing of, B., 71.  
 rosin soap, manufacture of, (P.), B., 778.  
 titanium, manufacture of, (P.), B., 118, 315, 650, 778, 1091.  
 white, purification of, (P.), B., 234.  
 effect of, on light fastness of coal tar dyes, B., 851.  
 optical examination of, B., 117.  
 characterisation of, B., 117.  
 dispersometric analysis of, B., 195.  
 Pills, use of agar-agar in, B., 321.  
 Pilocarpine, additive compounds of, with methylglyoxaline, A., 757.  
 hyperglycæmia from, A., 424.  
 separation of, quantitatively, from quinine, by means of gallotannin, A., 406.  
 Pimanthrene. See 1:7-Dimethylphenanthrene.  
 Pimanthrenequinone, A., 948.  
*d*-Pimaric acid, structure of, A., 1254.  
 oxidative degradation of, and its derivatives, A., 949.  
*d*-Pimaric acids, isomeric, and their derivatives, A., 1254.  
 Pimelamidine salts, A., 55.  
 Pimelaldehyde dioxime, A., 1114.  
 Pimelic acid, *p*-phenylphenacyl ester, A., 745.  
*Pimpinella saxifraga*, constituents of roots of, A., 662, 860.  
*n*- and *iso*-Pimpinellin, A., 662.  
 Pinacols, synthesis of, A., 1133.  
 dehydration reactions of, A., 391.  
 aromatic, substituted, formation of indenenes from, A., 273.  
 unsymmetrical, rearrangement of, A., 737.  
 Pinacol-pinacolin rearrangement, A., 515, 854.  
 Pinacolin deamination, A., 382, 1126.  
 Pinacolone, preparation of, A., 368.  
 Pine, localisation of essential oils and pitch resins in, A., 1179.  
 effect of alkali concentration on kraft pulp from, B., 302.  
 injury of, in N.-W. Germany, B., 39.  
 cypress, relation between durability and extractives of, B., 183.  
 Western yellow, toxicity of water-soluble extractives of, to *Lenzites sepiaria*, A., 204.  
 Pine bark, tannin balance in extraction of, B., 274, 740.  
 Pine needles, extracts of, B., 864.  
 determination of essential oils in preparations of, B., 656.  
 Pine oil, surface tension of, and potassium ethyl xanthate, A., 460.  
 disinfectants from, B., 402.  
 protection against wood borers by, B., 507.  
 American, *dl*-fenchyl alcohol from, A., 619.  
 Pine wood, constituents of, A., 1132.  
 lignothiolacetic acid from, A., 385.  
 decay of, B., 384.  
 Philippine, composition of, B., 773.  
 Pineapples, yield of, in relation to fertilisation, B., 1129.  
 conversion of unavailable potassium in soils for, B., 907.  
 potash fertilisers for, in Hawaiian Is., 907.  
 in Hawaii, insecticides for, B., 442.  
 vacuum fumigation of, B., 202.  
 determination of replaceable hydrogen in Hawaiian soils for, B., 394.  
*Pinellia tuberifera*, pharmacology of, A., 302.  
 Pinene, manufacture of, (P.), B., 974.  
 catalytic conversion of nopinene into, (P.), B., 128.  
 oxidation products of, A., 62.  
 hydrochlorides, fractionation of, A., 1140.  
 $\alpha$ -Pinene, oxidation of, by selenium dioxide, A., 1253.  
 $\alpha$ - and  $\beta$ -Pinenes, ultra-violet rotary dispersions of alcoholic solutions of, A., 215.  
 rotatory dispersion of benzene solutions of, A., 448, 561.  
*d*- and *l*- $\alpha$ - and  $\beta$ -Pinenes, effect of temperature on rotation of, A., 794.  
 Pinene glycol, and its derivatives, A., 62.  
 $\alpha$ -Pinene- $\alpha$ -hydroxylamine oxime, benzene-azo-derivative, and its copper salt, A., 750.  
*Pinus caribæa*, ether extractive of, B., 1126.  
*Pinus insignis*, resin of, B., 1091.  
*Pinus insularis*, Philippine, aldehyde rosin oil from, B., 736.  
 rosin from, B., 562.  
*Pinus longifolia*, composition of essence of, B., 864.  
*Pinus maritima* oil, sesquiterpene alcohol from, and its derivatives, A., 277.  
*Pinus nigra* and *sylvestris*, specific gravity of wood and crude resin in essence of, B., 154.  
*Pinus sylvestris*, Spanish, wood of, A., 1296.

- Pipes, transmission of heat to liquids in, B., 787.  
determination of pressure drop and heat transfer in, B., 483.  
fresh-air cooling of hot gases in, B., 83.  
corrosion of, in relation to soil type, B., 73.  
coating of, with aluminium paint, (P.), B., 197.  
coating compositions for, (P.), B., 1041.  
concrete, corrosion of, by water, B., 345.  
metal. See Metal pipes.
- $\alpha$ -Pipicoline, optically active, configuration of, A., 865.
- Piperazine, compound of, with ferrie inositolphosphate, A., 1127.  
derivatives of, A., 404.
- Piperazines, substituted, A., 625, 756, 1042.
- $\beta$ -Piperazinoethylamine dipicrate, A., 168.
- N*- $\beta$ -Piperazinoethylphthalimide dihydrobromide, A., 168.
- Piperidine, refractive index of binary liquid mixtures containing, A., 222.  
Raman spectrum of, A., 793.  
reaction of, with organic halides, A., 280.  
compound of, with ferrie inositolphosphate, A., 1127.  
and its dithiocarbamates, action of, on blood-sugar, A., 1163.
- Piperidine, 1-chloro-, reaction of, with magnesium phenyl bromide, A., 862.
- Piperidine series, ring closure in, A., 167.
- Piperidine-4-carboxylic acid, synthesis of, and its derivatives, A., 950.
- Piperidinobenzanthrone, A., 622.
- $\beta$ -Piperidino- $\alpha$ -benzoyl- $\beta$ -phenylpropionphenone, A., 515.
- $\alpha$ -Piperidinobutane, salts of, A., 168.
- $\alpha$ -Piperidinobutan- $\gamma$ -one, oxime, A., 168.
- 10-Piperidino-1:4-dimethylanthrone, 5:8-dichloro-, A., 1135.
- $\beta$ -Piperidino- $\alpha\alpha$ -dimethylpropaldehyde, and its derivatives, A., 504.
- $\gamma$ -Piperidino- $\beta\beta$ -dimethylpropyl alcohol, and its derivatives, A., 504.
- Piperidino- $\alpha\alpha$ - $\beta$ -dinaphthazine, A., 622.
- 4'-Piperidinodiphenyl, 4-chloro-2:3':5'-trinitro-, A., 260.
- $\beta$ -Piperidino- $\alpha\beta$ -diphenylpropionphenone, A., 514.
- $\beta$ -Piperidinoethylamine picrate, A., 168.
- 4- $\beta$ -Piperidinoethylamino-6-methoxy-2-methylquinoline, A., 168.
- N*- $\beta$ -Piperidinoethylphthalimide, A., 168.
- $\alpha$ -Piperidinoketocineole, and its oxime, A., 619.
- $\beta$ -Piperidinomethylisoamyl alcohol, and its derivatives, A., 504.
- $\alpha$ -Piperidinomethylhexahydrobenzaldehyde, A., 504.
- $\beta$ -Piperidinomethylhexahydrobenzyl alcohol, and its derivatives, A., 504.
- $\alpha$ -Piperidinomethyl- $\alpha$ -hydroxymethylisovaleraldehyde hydrochloride, A., 503.
- 1-Piperidinomethyl-1:2:3:4-tetrahydroacridine picrate, A., 167.
- $\alpha$ -Piperidinomethylisovaleraldehyde, and its hydrochloride, A., 504.
- 4-Piperidinonaphthalene, 1-amino-, and its benzoyl derivative, and 1-nitro-, A., 622.
- Piperidinonor-ricinine, A., 526.
- $\beta$ -Piperidino- $\alpha$ -phenyl- $\beta$ -*p*-anisylpropionphenone, A., 514.
- $\beta$ -Piperidino- $\alpha$ -phenyl- $\beta$ -3:4-methylenedioxyphenylpropionphenone, A., 514.
- $\beta$ -Piperidinopropionitrile, and its methiodide, A., 167.
- 2- $\beta$ -Piperidinoisopropylquinoline picrates, A., 167.
- 8-Piperidinoquinoline, 5-amino-, and its acetyl derivative, and 5-nitro-, A., 1050.
- Piperidinoquinolines, 8-nitro-, A., 622.
- 5-Piperidinoquinoline-8-arsinic acid, 6-nitro-, A., 1050.
- Piperidoguanidine nitrate, A., 605.
- 1-( $\alpha$ -Piperidyl- $\alpha$ -chlorobenzyl)- $\beta$ -naphthol, A., 515.
- 4-Piperidyl-3:9-dimethyl-4:5-dihydrouric acid, 5-hydroxy-, and its salts, and 7-acetyl derivative, A., 1045.
- 1-( $\alpha$ -Piperidyl- $\gamma$ -methoxybenzyl)- $\beta$ -naphthol, A., 515.
- 1-( $\alpha$ -Piperidyl-3:4-methylenedioxybenzyl)- $\beta$ -naphthol, A., 515.
- Piperitolic acid. See Carvenolic acid.
- Piperitone, bromo-, A., 750.
- Piperonal, determination of, microchemically, A., 530.
- Piperonyl radical, affinity capacity of, A., 390.
- Piperonylalanine, and its phenylcarbimido-derivative, A., 1144.
- Piperonyl benzyl ketone, and its semicarbazone, A., 390.
- 2:3-(2-Piperonylchromano-3:4)-quinoline, A., 175.
- 1- $\beta$ -Piperonylethylidihydrodrastinine, and its picrate, A., 1262.
- $\alpha$ -Piperonylethyl methyl ketone, and its semicarbazone, A., 391.
- 1- $\beta$ -Piperonylethylmorhydrastinine, and its picrate, A., 1262.
- $\beta$ -Piperonylethylphthalamic acid, A., 1262.
- Piperonylglycollic acid, ethyl ester, A., 391.
- Piperonylhydantoin, A., 1144.
- Piperonylidenebisthiolacetic acid, A., 1235.
- Piperonylideneacyanoacetic acid, 6-nitro-, A., 1247.
- Piperonylidene-2-thiohydantoin, A., 1144.
- $\alpha$ -Piperonyl- $\alpha$ -methylethyl methyl ketone, and its semicarbazone, A., 391.
- $\alpha$ -Piperonyl- $\alpha$ -methylpropaldehyde, and its derivatives, A., 391.
- $\alpha$ -Piperonyl- $\beta$ -methylpropyl alcohol, A., 391.
- $\alpha$ -Piperonyl- $\beta$ -methyl- $\Delta^4$ -propylene, and its dimeride and oxide, A., 391.
- $\alpha$ -Piperonyl- $\beta$ -methyl- $\alpha\beta$ -propylene glycol, A., 391.
- $\beta$ -Piperonylpropionitrile,  $\alpha$ -bromo- $\beta$ -hydroxy-, A., 1247.
- $\beta$ -Piperonylpropiono- $\beta$ -3':4'-dimethoxyphenylethylamide, A., 1262.
- $\beta$ -Piperonylpropiono- $\beta$ -piperonylethylamide, A., 1262.
- Pipettes, manipulator for, A., 1182.  
safety device for, A., 358.
- Piqûre, effect of, on adrenaline, sugar, and pressure in blood, A., 425.
- Pistons, aluminium alloy for, (P.), B., 609.
- Pisum sativum*. See Peas.
- Pitch, production of, from tars rich in creosote, (P.), B., 829.  
coking of, (P.), B., 874.  
distillation of, into coke, (P.), B., 490.  
viscosity of, B., 87, 134, 1015.  
compositions containing, (P.), B., 712.  
coating of paper with, (P.), B., 544.  
coal tar, carbonisation of, B., 455.  
separation in mixtures of petroleum asphalt and, B., 327.  
high- and low-melting point, production of, in distillation of tar, (P.), B., 587.
- Pitchblende, Morogoro, analysis of, B., 145.  
determination in, of uranium, A., 244.
- Pithecolobine, and its salts, A., 975.
- Pithecolobium saman*, constituents of bark of, A., 975.
- Pitocin, effect of, on fat and glycogen in liver and muscle, A., 885.
- Pitressin, effect of, on fat and glycogen in liver and muscle, A., 885.
- Pituitary, A., 655.  
extraction of active substances from, (P.), B., 207.  
differentiation of antisera from anterior and posterior lobes of, A., 1153.  
bromine content of, A., 1274.  
growth-promoting hormone of, A., 546.  
effect of, on metabolism, A., 1172.  
anterior lobe, effect of acid extracts of, on iodine in blood and thyroid, A., 885.  
effect of, on carbohydrate metabolism of liver, and its relation to the thyroid, A., 1172.  
hormone from, and its effect on blood constituents, A., 432.  
hormonal-nervous regulation of function of, A., 1172.  
fat metabolism hormone from, A., 780.  
determination of hormone of, in blood, A., 885.  
posterior lobe, oxytocic principle of, A., 655.
- Pituitary extracts in relation to sleep, A., 1293.  
proteins in, B., 1137.  
anterior lobe, effect of, on tissues, A., 1172.  
excito-secretory action of, on thyroid, A., 970.  
anti-diuretic and oxytocic potencies of, A., 1293.  
posterior lobe, effect of, on distribution of fat and glycogen, A., 1293.  
effect of, on glycogen in liver and muscle, A., 780.  
assay of, A., 885.
- Pitutocin, structure of, A., 1172.
- Placenta, permeability of, A., 773.  
glycogen in, in eclampsia, A., 768.  
hormonal action of, A., 1173.  
extraction of physiologically active substances from, (P.), B., 1008.  
dog's, green pigment in, A., 627.  
human, respiration and fermentation of, A., 961.
- Plague, bacteriophage from serum and bubo in, A., 652.
- Plant, chemical, materials for construction of, B., 627, 1059.  
iron alloys for construction of, B., 1107.  
nickel-chromium steel for, (P.), B., 231.  
relative merits of welding and riveting for, B., 66.
- Plants, variability of composition of, A., 1181.  
growth of, in relation to soil acidity, B., 38, 1097.  
effect of reaction and nutrient content of soils on, B., 362.  
effect of reaction of greenhouse soils on, B., 158.  
effect of nitrogen deficiency on, B., 395.  
effect of nitrogen and phosphoric acid on, B., 200.  
nitrogen and potash "effect factors" for, B., 362.  
effect of Italian radioactive soils on, A., 661.  
growth hormone of, A., 549.  
growth-promoting substances for, A., 661.  
use of active charcoal in manuring of, B., 277.  
effects of single and fractional applications of soluble nitrogen on nitrates in soils and, B., 522.  
influence of adsorbed cations on utilisation of soil phosphorus by, B., 523.

Plants, reduced frost injury to, due to  
potash fertilisers, B., 317.  
potash manuring and susceptibility of,  
A., 438.  
chemistry of, A., 663.  
action of uranium radiation on, B., 363.  
as electrical conductors, A., 783.  
effect of freezing on, B., 1097.  
effect of frost on, A., 786.  
absorption by, B., 318, 653.  
absorption of nitrogen, phosphorus, and  
potassium by, B., 276.  
influence of ammonium nitrate on ab-  
sorption of potassium by, B., 653.  
absorption of salts by, A., 660.  
penetration of petroleum oils into tissues  
of, B., 75.  
permeability of protoplasts in, to non-  
electrolytes, A., 786.  
flow of sap in, A., 661.  
effect of environment on properties of  
sap of, A., 1296.  
osmotic concentration of cell-sap in, A.,  
977.  
nutrition of, A., 660.  
effect of lime on, B., 199.  
effect of silicic acid on, B., 696.  
influence of bedrock on nutrients for, in  
clays, B., 617.  
nitrogenous nutrition of, A., 1179.  
assimilation of ammonium nitrate by,  
A., 99.  
assimilation of carbon dioxide by, A., 98.  
utilisation of mineral matter in leaves  
by, A., 660.  
assimilation of phosphorus by, B., 522.  
respiration of, A., 1176.  
interrelation of substances in, A., 665.  
base-exchange reactions in, A., 549.  
formation of alkaloids and betaines in,  
A., 975.  
aluminium in, A., 549.  
amylase of, A., 1286.  
bromine in, A., 205, 785.  
synthesis of carotenoids in, A., 976.  
chlorophyll in, A., 100.  
choline metabolism in, A., 1179.  
cobalt in, A., 549.  
colloids of, and their osmosis and diffu-  
sion, A., 808.  
colouring matters of, A., 976, 1256.  
physiological activity and formation of  
dyes in, A., 101.  
accumulation of electrolytes in, A., 977.  
action of alkaloids and carbon monoxide  
on enzymic activity of, A., 649.  
action of hormones on, A., 547.  
action of follicular hormones on, A., 1068.  
distribution of iron in, A., 1181.  
nitrate reduction of, A., 890.  
movement of organic substances in, A.,  
435.  
influence of phosphates on phosphoric  
acid in, B., 696.  
intake of phosphoric acid by, B., 812.  
phosphorus compounds of, A., 1181.  
phosphorus organic compounds in, A.,  
1181.  
concentration of potassium isotopes in,  
A., 976.  
regulation of protein metabolism in, A.,  
436.  
activators and paralyzers in protein  
metabolism of, A., 548.  
selenium in, A., 976.  
deposition of starch in, A., 100.  
vitamins in, A., 1176.  
role of potash in water economy of, B.,  
567.  
exchangeable cations of soils and, B., 692.

Plants, physiological action of homologous  
ionic series on, B., 695.  
physiological effect of mineral soil  
acidity on, B., 856.  
physiological effect of Thomas slag and  
its impurities on, B., 523.  
relation between soil and, in the Tatra  
Mts., A., 1296.  
coloration of, during desiccation, A.,  
313.  
hardiness of, from conductivity measure-  
ments, A., 549.  
wilting of, in relation to available water  
in soil, B., 440.  
transpiration and wilting of, in relation  
to water condition of soil, B., 954.  
suspensions for spraying of, B., 39.  
irritability and anaesthesia in, A., 550.  
cancer of, in relation to potassium, A.,  
438.  
use of basic fuchsin in anatomy of, A.,  
978.  
Plants, agricultural, growth of, A., 974.  
aquatic, molybdenum in, A., 976.  
effect of sodium chlorate on, B., 618.  
chlorophyll-defective, catalase and sugar  
determination in, A., 314.  
cultivated, synthesis and metabolism  
in, A., 660.  
influence of potash manuring on resist-  
ance to disease of, B., 856.  
cut, preservation of, (P.), B., 618.  
desert, essential oils from, A., 888.  
flowering, treatment of, to advance  
flowering period, (P.), B., 814.  
fodder, vitamin-C in, A., 1176.  
forage, effect of leaching on nutritive  
value of, B., 205.  
fresh, action of carbon monoxide on, A.,  
435.  
green, hydrolysis in, by moonlight, A.,  
975.  
higher, nutrition of, A., 312.  
influence of development of, on micro-  
organisms in soils, B., 74.  
arginine metabolism and urea pro-  
duction in, A., 1179.  
intake and expiration of carbon  
dioxide by, A., 783.  
intake of ions by, A., 890.  
abstraction of ions from salt solutions  
by, A., 438.  
nitrates and ammonium salts as sources  
of nitrogen for, at constant  $p_H$ , B.,  
276.  
urea and ureides in, A., 101, 313.  
insectivorous, proteases of, A., 1064.  
living, detection of nitrogen and potass-  
ium deficiencies in, A., 204.  
parasitic, osmotic relations between  
host plants and, A., 977.  
succulent, respiration of, A., 1176.  
tanning, from Italian Somaliland and  
Trans-Juba, B., 852.  
detection of migration of materials in, A.,  
977.  
detection in, of volatile fatty acids, A.,  
203, 780.  
determination in, of manganese, B., 568.  
of nitrates, phosphates, and potassium  
by a field method, B., 953.  
of santonin, B., 1136.  
Plant ash, action of, on growth and  
haemoglobin synthesis, A., 1052.  
determination of constituents of, B.,  
568.  
Plant cells, isoelectric point of nuclei of,  
A., 1181.  
staining of, with erythrosin, A., 205.  
effect of heavy-metal salts on, A., 206.

Plant cells, effect of oxygen concentration  
on oxidation in, A., 98.  
death of, in anaerobiosis, A., 786.  
large, properties of, A., 890.  
living, absorption of solutes by, A., 664.  
detection of phosphorus in, A., 205.  
Plant extracts, determination in, of sugars,  
A., 666.  
Plant materials, apparatus for extraction of,  
with ether, A., 661.  
biological decomposition of, A., 93, 195,  
888.  
determination in, of methoxyl, lignin, and  
cellulose, B., 618.  
Plant membranes, woody, detection of,  
with phloroglucinol and hydrochloric  
acid, A., 202.  
Plant products, sulphited, determination in,  
of sulphur dioxide, B., 1006.  
Plant tissues, microchemistry of, A., 978.  
detection in, of caffeine, A., 1150.  
determination in, of acids, A., 1178.  
of carbon, A., 102.  
of bound water, A., 977.  
Plant viruses. See under Viruses.  
Plant waxes. See under Waxes.  
Plasma proteins in relation to blood  
hydration, A., 642.  
diffusibility of, A., 81.  
dog's, products of hydrolysis of, A., 636.  
Plastein, A., 651.  
Plaster, production of, (P.), B., 642, 984.  
ovens for, (P.), B., 107.  
mixing of, (P.), B., 773.  
colouring of, (P.), B., 800.  
waterproofing of surface of, (P.), B., 1033.  
wall, (P.), B., 26.  
painting of, B., 183.  
treatment of, for painting, B., 183.  
Plaster of Paris, production of, (P.), B., 642.  
setting of, B., 424.  
manufacture of bodies of, (P.), B., 601.  
Plastics, crystallo-polyamphionic theory of,  
A., 911.  
containing rubber, fillers, and reinforcing  
pigments for, (P.), B., 1041.  
Plastic compositions, (P.), B., 475, 998.  
manufacture of, (P.), B., 1042.  
from cellulose esters or ethers, (P.), B.,  
519.  
from olefine polysulphides, (P.), B.,  
119, 475.  
for leather substitutes, (P.), B., 1042.  
Plastic masses, manufacture of, (P.), B.,  
357, 737.  
from cellulose acetate, (P.), B., 1042.  
colours for, (P.), B., 520.  
moulding of, (P.), B., 984.  
by extrusion, B., 736.  
coating of ropes or cords with, (P.), B.,  
806.  
Plastic materials, manufacture of, (P.), B.,  
236, 902, 948.  
from fibrous materials, (P.), B., 882.  
from resins, phenol, aldehydes, and  
alkali, (P.), B., 737.  
use of cellulose acetate in, B., 517.  
removal of gases from, (P.), B., 165.  
removal of solvents from, (P.), B., 997.  
cementing agents for, (P.), B., 614.  
apparatus for measurement of shearing  
strength of, B., 484.  
theories of flow of, A., 13.  
manufacture of articles of, (P.), B., 904.  
Plasticisation, effect of, on properties of  
materials, B., 404.  
Plasticisers, (P.), B., 118, 519.  
Plasticity, B., 324.  
measurement of, (P.), B., 5.  
mechanism of, A., 904.

- Plasticity, and thixotropy, B., 627.  
parallel-plate, B., 867.
- Plates, porous, properties of, A., 593.
- Platinum, B., 109.  
early history of, A., 594.  
separation of, from other precious metals, (P.), B., 191.  
absorption spectrum of, A., 3.  
photo-electric emissivity of, A., 669.  
effect of oxygen on electron emission from, A., 1073.  
electrical resistance of thin layers of, A., 219.  
electrolytic transfer of, in hydrochloric acid solution, A., 231.  
electrodeposition of, B., 645; (P.), B., 311.  
heat of adsorption of hydrogen by, A., 118.  
adsorption of hydrogen on, A., 568, 688.  
transparency of thin sheets of, A., 552.  
mosaic crystals in, A., 903.  
diffraction of electrons by single crystals of, A., 209.  
history of development of catalysts of, B., 265.  
action of iodine on, A., 128.  
action of oxides on, at high temperatures, A., 240.  
nitro-compounds of, A., 240.  
and its alloys in dentistry, B., 266.  
glowing, emission of, in gases, A., 1072.  
decomposition of nitrous oxide on, A., 819.
- Platinum alloys for pen nibs, (P.), B., 68.  
with copper and with nickel, A., 221.  
with gold, A., 221.  
age-hardening of, B., 266.  
with iridium, B., 554.  
with iron, properties of, B., 554.  
with molybdenum and tungsten, (P.), B., 609.  
with palladium or iridium, "stone test" on, B., 429.  
with tin, molecular heat and crystal structure of, A., 1195.
- Platinum bases, A., 240.  
Diamminoplatinous chlorides, isomeric, structure of, A., 562.  
Tetramminoplatinous chloride, crystal structure of, A., 797.  
dihalides, structure of, A., 562.
- Platinum compounds, chelate, A., 1101.  
complex, conductivity of, A., 214.  
solid solutions of, A., 564.
- Platinum salts, stereochemistry of, A., 215.  
Platinic chloride, standardisation of solutions of, A., 245.  
action of charcoal on, A., 992.  
Chloroplatinates, determination in, of iridium, A., 245.
- Platinum organic compounds, A., 1039.  
complex, A., 353.
- Platinum determination:—  
spectrographic analysis of, and its alloys, B., 266.  
determination of, potentiometrically, A., 1104.
- Platinum black, precipitation of, A., 33.  
occlusion of hydrogen by, A., 16.
- Platinum electrodes. See under Electrodes.
- Platinum metals, distribution of, in South African deposits, A., 248.  
electrodeposition of, (P.), B., 473.  
surface effects of, on assay beads, B., 681.  
univalent stage of, A., 32.
- Platinum ores, Transvaal, minerals in, A., 1014.
- Pleuronectes platessa*, constituents of, A., 871.
- Plexus pampiniformis, bromine content of, A., 958.
- Plumbago rosea*, constituents of root-bark of, A., 889.
- Plumbimandelic acid, sodium salt, A., 269.
- Plumbisalicic acid, sodium salt, A., 269.
- Pneumococcus, A., 545.  
broth for culture of, A., 653.  
breakdown of glucose by, A., 653.  
specific substances for immunisation against, A., 653.  
dehydrated, resistance of, to heat and chemicals, A., 94.  
types I and II, lipase action of, A., 1170.  
products, antibody response of human subjects to injection of, A., 1170.
- Polarke obscura*, effect of thiol compounds on regeneration in, A., 877.
- $\alpha$ - and  $d$ -Podocarpenes, and their derivatives, B., 321.
- Podophyllhydrazide, A., 1258.
- Podophyllic acid, and its derivatives, A., 618, 1258.
- Podophyllin, A., 1258.
- Podophyllum indicum*, extraction of podophyllotoxin from, A., 618.
- Podophyllomerol, and its picrate, A., 1258.
- Podophyllomeronic acid, and its derivatives, A., 618, 1258.  
methyl ester, A., 1137.
- Podophyllotoxin, constitution of, and its derivatives, A., 618, 1137.
- Poirrier-blue, A., 1101.
- Poisons, coating of, to prevent their inadvertent use, (P.), B., 626.  
detoxification of, by Congo red, A., 1163.  
in edible fungi, A., 965.  
amphibian, A., 965.  
fish, relation between toxicarol and rotenone group of, A., 619.  
industrial, effect of, on antibody formation, A., 1060.  
stomach, toxicity of, to insects, B., 570.  
toad, A., 397, 1142.  
vegetable nerve, effect of, on intermediary protein metabolism, A., 424.  
vegetable, fish, and insect, A., 619, 751.
- Poisoning, arsenic, of cells, A., 537, 880.  
arsenic, lysol, and mercury, A., 192.  
benzoic acid, phloridzin, and phosphorus, excretion of creatine and creatinine in, A., 422.  
cadmium, A., 774.  
history of, A., 648.  
in coffee, B., 46.  
carbon tetrachloride, influence of diet on, A., 878.  
carbon monoxide, A., 963.  
from a gas heater, B., 865.  
action of colloidal sulphur in, A., 963.  
chloroform, effect of, on carbohydrate metabolism, A., 1057.  
ethyl urethane, A., 88.  
hydrocyanic acid, inhibition of, by carbohydrates, A., 963.  
lead, A., 1164.  
of stock fed on herbage adjacent to coke ovens, B., 743.  
porphyrin in urine in, A., 542.  
mercury, blood-sugar in, A., 633.  
in relation to hæmoglobin, A., 879.  
morphine, chronic, in dogs, A., 1284.  
nickel carbonyl, A., 878.  
oxidative, A., 964.  
percaline, A., 878.  
phloridzin, fat transport through lymph in, A., 878.  
phosphorus, effect of, on carbohydrate metabolism, A., 961.
- Poisoning, potassium cyanide, effect of, on glycogen in liver and muscle, A., 1164.  
secondary, of birds and mammals, A., 542.  
thiocyanate, A., 1285.  
zinc phosphide, zinc content of organs in, A., 1060.
- Polar liquids. See Liquids, polar.
- Polar molecules. See under Molecules.
- Polar reactions. See under Reactions.
- Polarimeter, photo-electric, A., 1012.
- Polarisation, measurement of, by commutator methods, A., 701.  
concentration, A., 1000.  
electrolytic, theory of, A., 915.  
magnetic rotatory, A., 215.  
of liquids, A., 111.  
molecular, in relation to dissymmetry, A., 9.  
of binary mixed liquids, A., 110.
- Polariscopes, photoelectric, A., 245.
- Polarity of chemical compounds, A., 677.
- Polecat, fat of, A., 870.
- Polianite, synthesis of, A., 1229.
- Polishes, manufacture of, (P.), B., 272, 1090.
- Pollen, germination of, A., 976.  
concentration-power of cytoplasm in, A., 977.  
membranes of, A., 665, 784.
- Pollenin, from brown coal, A., 665.
- Polonium, concentration of, from active lead nitrate, A., 920.  
 $\alpha$ -rays from, A., 671.  
range of, A., 1186.  
disintegration of elements by, A., 555.  
excitation of nuclear  $\gamma$ -rays in beryllium and lithium by, A., 210.  
quantum energy of  $\gamma$ -rays from, A., 210.  
electrodeposition of, from an alkaline medium, A., 236, 570.  
on metals, A., 700.  
solubility and distribution of, in alloys, A., 1186.  
solubility of, in metals, A., 568.  
colloid chemistry of, A., 17.  
precipitation of, by oxalates in nitric acid, A., 802.
- Polonium ions, complexity of, A., 914.
- Polyazo-dyes, for cotton and viscose silk, (P.), B., 59.  
direct, production of, (P.), B., 975.
- $\mu$ -Polychloroprene, examination of, with X-rays, B., 852.
- $\alpha$ -,  $\beta$ -,  $\omega$ -, and  $\mu$ -Polychloroprenes, B., 156.
- Polycyclic compounds containing two CO groups, (P.), B., 138.
- Polycythæmia in rats, on milk-iron-copper diet supplemented by cobalt, A., 633.
- Polycythæmia vera, mineral metabolism in treatment of, A., 642.
- Polyenes, A., 834.  
reversible hydrogenation and dehydrogenation of, A., 1138.
- Polyenecarboxylic acids, methylated, *cis-trans*-isomeric, synthesis of, A., 600.
- Polygalactae*, saponins in, A., 785.
- Polygalacturonic acid, salts of, A., 1235.
- Polygama tenuifolia*, isolation of polygaritol from, A., 929.
- Polygaritol, isolation of, and its tetra-acetyl derivative, A., 929.
- Polyhalides, A., 912, 996.
- Polyhalite, extraction of potassium sulphate from, (P.), B., 305.  
New Mexican, production of potash fertilisers from, B., 883.
- Polyhydroxides, optical study of reaction of, with Schweitzer's reagent, A., 1007.
- Polyhydroxy-compounds, synthesis of, A., 497.  
precipitation of, by metallic hydroxides, in alkaline solution, A., 933.

- Poly-inenes, rearrangement of, A., 505.  
 Polyiodides. See under Iodine.  
 Polyisavans, natural, A., 1021.  
 Polymerisation, A., 46, 121, 225, 361, 496, 1080; B., 738.  
   mechanism of, A., 507.  
   under high pressure, A., 367.  
   and condensation, A., 145.  
   and ring formation, A., 366, 601, 1233.  
 Polymethine dyes, manufacture of, (P.), B., 14, 541.  
   basic, manufacture of, (P.), B., 834.  
 Polymethylbenzenes, A., 607.  
 Polymethylenediguanidine compounds, manufacture of, (P.), B., 1008.  
 Polymorphism, A., 149.  
   of substances of high mol. wt., A., 910.  
 Polyneuritis in birds, A., 644.  
 Polyoxyethylenes, structure of, A., 1080.  
   formation of, A., 721.  
   comparison of precipitates of copper oxalate and, A., 131.  
 Polypeptides, constitution of, A., 304.  
   physico-chemical behaviour of, A., 503, 954.  
   sulphonation of, A., 1022.  
   action of alkali on, A., 1269.  
   action of enzymes on, A., 194.  
   from *l*(+)-alanine, action of alkali and enzymes on, A., 194.  
   determination of, in protein solutions, A., 182.  
 Polyphalite, recovery of potassium from, B., 1118.  
 Polyporus *hispidus*, effect of, on wood, A., 195.  
 Polyrans, homologous, A., 249.  
 Polysaccharides, A., 42, 44, 45, 256, 835, 1022, 1115, 1116, 1117.  
   constitution of, A., 255, 835.  
   molecular structure of, A., 502.  
   dependence of molecular magnitude in, on  $p_H$ , A., 724.  
   osmometric investigation of, in dilute solution, A., 1021.  
   hydrolysis of, A., 233, 370, 501.  
   pneumococcus type III, decomposition of, by bacterial enzymes, A., 94.  
   yield of specific enzyme in cultures of bacilli decomposing, A., 884.  
   *p*-amino- and *p*-nitro-benzyl ethers of, A., 197.  
   determination of, A., 884.  
   specific, molecular weight of, A., 779.  
   physico-chemical properties of, A., 335.  
   detection of, by nitro-chromic acid reaction, A., 718.  
 Polyselenides. See under Selenides.  
 Polysulphides. See under Sulphides.  
 Polyterpenes, A., 749, 948, 1254.  
 Polyterpenoids, A., 749.  
 Polytrichum *commune*, toxicity of salts to, A., 666.  
 Polyvinyl alcohols, manufacture of condensation products of, (P.), B., 95.  
   manufacture of viscous solutions from, (P.), B., 95.  
 Polyvinyl compounds, hydroxyalkyl derivatives, manufacture of, (P.), B., 495.  
 Ponceau-2R and -3R, B., 592.  
 Popillia *japonica*, control of, on fruit and shade trees, B., 955.  
   effects of spray deposits on foliage on, B., 813.  
   repellants for, B., 570.  
 Poppies, effect of ageing on alkaloids in capsules of, A., 664.  
 Porcelain, manufacture of, (P.), B., 888.  
   influence of firing temperature on dielectric strength of, B., 229, 343.  
 Porcelain, coating of, with copper, (P.), B., 467.  
   decoration of, (P.), B., 182.  
   joining of metals to, (P.), B., 990.  
   electrokinetic potential of diaphragms of, A., 1208.  
   manufacture of moulds of, (P.), B., 343.  
   high-fired, X-ray examination of, B., 64.  
 Porcelain bodies, shrinkage of, B., 23.  
 Softening of, B., 888.  
   progress of fluidity in, B., 63.  
 Porcelain enamels. See under Enamels.  
 Porcelain insulators. See under Insulators.  
 Pork, effect of feeding pigs with soya beans and soya bean meal on quality of, B., 284.  
   gas storage of, B., 749.  
 Porous bodies, manufacture of, (P.), B., 263.  
 Porous masses, production of, from slags, etc., (P.), B., 628.  
 Porphyrins, A., 172, 173, 285, 864.  
   ring synthesis of, A., 626.  
   derived from bacteria, A., 969.  
   from chlorin *c*, and their derivatives, A., 626.  
   determination of, with the step-photometer, A., 978.  
 Porphyrins, chloro-, complex iron salts of, A., 1264.  
 Porphyrinuria, porphyrins in, A., 768.  
 Porpoise, vitamin-D content of fat of, A., 887.  
 Potash. See Potassium hydroxide.  
 Potash salts, origin and transformation processes in German beds of, B., 259.  
 Potassium, atomic weight of, by potentiometric titration, A., 1185.  
   nuclear moment of, A., 667.  
   concentration of isotopes of, in plants, A., 976.  
   recovery of, from polyphalite, B., 1118.  
   Zeeman effect in spectrum of, A., 103, 551.  
   red band spectrum of, A., 207.  
   molecules, magnetic rotation spectrum and heat of dissociation of, A., 207.  
   radioactivity of, A., 555, 1073.  
   photo-emission from, A., 553.  
   vapour, formation of ions in, A., 1073.  
   surface ionisation of, by tungsten, A., 980.  
   density of solutions of, in liquid ammonia, A., 1200.  
 Potassium alloys with sodium, liquid, viscosity of, A., 800.  
 Potassium salts, deposits of, at Stebnik, A., 1228.  
   production of, from wyomingite, B., 884.  
   dielectric constants of, A., 899.  
   corrosive action of solutions of, on metals, B., 985.  
   concentration of, in living cells, A., 890.  
   clinical action of, A., 1159.  
   effect of, on mineral exchange in man, A., 962.  
   distribution of, in blood of dogs, A., 1272.  
 Potassium alum, latent and specific heats of, A., 1081.  
   chromium alum, green and violet forms of, A., 708, 912.  
   bromide, heat of dilution and heat content of solutions of, A., 998.  
   equilibrium of, with cadmium bromide and water, A., 574.  
   with mercuric bromide and water, A., 913.  
   polybromide, A., 822.  
   carbonate, thermal dissociation of, A., 468.  
 Potassium carbonate, removal of sodium carbonate from solutions of, (P.), B., 260.  
   equilibrium of, with ammonia and water, A., 697.  
   reaction of, with chlorine, A., 349.  
   carbonate and hydrogen carbonate, equilibria of, with water, A., 229.  
   carbonate and hydroxide, production of, (P.), B., 934.  
   chlorate, production of, B., 20.  
   effect of potassium chloride on hygroscopicity of, A., 1199.  
   viscosity of, in aqueous solution, A., 993.  
   crystal structure of, A., 681.  
   chloride, preparation of carbon dioxide and, by the Engel-Precht method, B., 144.  
   recovery of, from alkaline brine, (P.), B., 885.  
   spectrum of, A., 6.  
   conductivity of, in sucrose solution, A., 1206.  
   activity coefficient of, in aqueous solution, A., 912.  
   elimination of liquid contact potentials with, A., 343.  
   transference numbers of aqueous solutions of, A., 914.  
   dielectric constant of aqueous solutions of, A., 9.  
   influence of magnesium salts on solubilities of mixtures of sodium chloride and, A., 568.  
   cohesion limits for crystals of, A., 799.  
   equilibria of, with cadmium chloride and water, A., 469.  
   with lead chloride and water, A., 810.  
   with magnesium and sodium chlorides, A., 1205.  
   with potassium iodate and water, A., 341.  
   with sodium chloride and water, A., 339, 1091.  
   with sodium and magnesium chlorides in water, B., 259.  
   effect of, on hygroscopicity of potassium chlorate, A., 1199.  
   determination of, in sylvite, A., 488.  
   chloride and nitrate, boiling point of mixtures of, with ammonium chloride and nitrate, A., 222.  
   chloride and sulphate, vapour pressure of saturated aqueous solutions of, A., 339.  
   chloroplatinate, separation of, A., 1222.  
   chromate, crystallography of, A., 682.  
   fluoborate and permanganate, equilibrium of water and, A., 341.  
   fluoride, fusion curve of, with aluminium fluoride, A., 810.  
   tantalum- and niobium-heptafluorides and titanium hexafluoride, crystal structure of, A., 114.  
   fluorurate, preparation of, (P.), B., 678.  
   halides, cohesion limits for crystals of, A., 799.  
   hydroxide (*caustic potash*), manufacture of, by the magnesium method, B., 100.  
   recovery of, from blast-furnace gas at Kamaishi Iron Works, B., 144.  
   from nitrogenous waste materials, (P.), B., 464.  
   Raman spectrum of aqueous solutions of, A., 675.  
   heat capacity of aqueous solutions of, A., 696.  
   constancy of Mitscherlich coefficient of, B., 568.

**Potassium hydroxide**, velocity of absorption of carbon dioxide by, A., 577.  
 thermodynamics of, A., 573.  
**iodate**, equilibrium of, with carbon monoxide and hydrogen, A., 1211.  
 with potassium chloride, nitrate, and sulphate and water, A., 341.  
**iodide**, electrolytic transport of water in solutions of, A., 698.  
 reactions of, with ethylenic dibromides, A., 475.  
 effect of ingestion of, by pregnant ewes, A., 1164.  
 effect of, on distribution of chlorides and iodides in skin and muscle, A., 426.  
 analysis of, A., 711.  
*polyiodides*, solid, A., 480.  
*diiodoiodide hydrate*, A., 350.  
 manganate, use of, in volumetric analysis, A., 491.  
**permanganate**, absorption spectrum of solutions of, A., 557.  
 velocities of reaction of, with carbon monoxide and hydrogen, A., 1211.  
 reaction of, with hydrogen peroxide in acid solution, A., 1094, 1210.  
 with oxalic acid, A., 1002.  
*permolybdate*, A., 484.  
**nitrate** (*saltpetre*), preparation of, from the chloride, B., 62.  
 production of, (P.), B., 62, 102, 934.  
 from the chloride and nitrogen peroxide, B., 304.  
 f.p. of solutions of, A., 912.  
 solubility of, in liquid ammonia, A., 990.  
 equilibrium of, with ammonium nitrate and water, A., 810.  
 with lead nitrate, A., 468.  
 with lead and sodium nitrates, A., 1205.  
 with potassium iodate and water, A., 341.  
 waterproof bags for, (P.), B., 60.  
 nitrite, fusion curve of, and sodium nitrite, A., 809, 810.  
 cobalt and nickel nitrites, A., 483.  
*peroxide*, thermal dissociation of, A., 468.  
*pyrosulphite*, crystal structure of, A., 903.  
*perphenate*, electrolysis of aqueous solutions of, A., 236.  
 solubility of, in water, A., 801.  
 crystallography of, A., 582.  
*rheni-iodide*, A., 133.  
*selenites*, A., 584.  
*silicates*, phase study of, A., 697.  
*aluminium silicates*, volatilisation of potash from, B., 339.  
*stannodiquatetrachloride*, use of, in volumetric analysis, A., 712.  
*sulphate*, manufacture of, (P.), B., 599.  
 from gypsum and dolomite, B., 144.  
 recovery of, from polyhalite, (P.), B., 305.  
 heat of dilution of, A., 23.  
 crystal habit of, A., 450.  
 equilibrium of, with potassium iodate and water, A., 341.  
 with water, A., 810.  
 sodium sulphate, production of, (P.), B., 464.  
*persulphate*, velocity of reaction between sodium thiophenoxide and, A., 345.  
 photochemical decomposition of, A., 1214.  
*dithionate*, crystal structure of, A., 1079, 1192.  
 silver thiosulphate, A., 1007.

**Potassium determination** :—  
 determination of, A., 136, 711, 922.  
 colorimetrically, A., 102.  
 volumetrically, A., 136, 1103.  
 with perrhenic acid, A., 488.  
 by means of sodium potassium cobalt-hexanitrite, A., 34, 35.  
 in phosphate fertilisers, B., 597.  
 in triple superphosphates, B., 62.  
 in presence of sodium, A., 711.  
 in soils, etc., B., 1045.  
 in soils with cobaltinitrite, B., 1129.  
 in tobacco, B., 703.  
 in wines, B., 814.  
**Potassium ions**, equivalent conductance of, A., 914.  
**Potatoes**, quality of, B., 239.  
 specific gravity of, in relation to dry substance and starch contents, B., 398.  
 fertiliser requirements of, B., 318.  
 fertilisers for, B., 478.  
 on high-moor soils, B., 568.  
 time of application of, B., 123.  
 effect of fertilisers on formation of scab in, B., 1047.  
 effect of manuring on seed value of, B., 1046, 1096.  
*glutathione* from, A., 889.  
 nitrogen compounds of, A., 889.  
 microchemistry of starch in, A., 100.  
 tyrosinase in, A., 1286.  
 occurrence of vitamin-C in, A., 97.  
 toxicity of aliphatic alcohols to, A., 306.  
 ensilage of, by embedding in potato mash, B., 200.  
 effect of storage on composition of, B., 954.  
 sprouting of, on storage, A., 784.  
 inhibition of, by volatile fruit products, A., 549.  
 spray insecticides for, B., 813.  
 effect of lubricating oil sprays on, B., 908.  
 brown discoloration of, during steaming, B., 285.  
 souring of, in distilleries, B., 619.  
 influence of yeast extract on saccharification of mashies of, B., 77.  
 corticium disease of, B., 396.  
 mosaic disease in, A., 438.  
 cooked, use of, in baking of bread, B., 444.  
 dormant, effect of chemical treatment on, A., 201.  
 healthy and leaf roll, respiration of, A., 98.  
 minced, ensilage of, B., 277.  
 seed, dusting of, B., 783.  
 sweet, critical temperature in cooking of, B., 784.  
 chemical changes in carbohydrates in, during cooking, B., 205.  
 production of starch from, B., 76.  
 Triumph, effect of maturity and ethylene chlorohydrin seed treatment on dormancy of, B., 318.  
**Potato flakes**, manufacture of, B., 1134.  
 quality of, B., 861.  
 use of, in production of yeast, B., 1051.  
 nutrient value of, B., 784.  
**Potato flour**, colour, lustre, and appearance of, B., 396.  
 determination of colour and "appearance" of, B., 396.  
 determination of quality of, for paper-making, B., 397.  
 determination in, of bacteria, B., 957.  
**Potato glucose**. See under Glucose.  
**Potato plants**, growth of, in relation to soil acidity, B., 568.

**Potato plants**, influence of water and nutrient contents of soils on root growth of, B., 318.  
 effect of fertilisers on diurnal and seasonal changes in sugar content in sap and tissue of, B., 697.  
 effect of leaf roll on assimilation in, A., 666.  
**Potato starch**. See under Starch.  
**Potential**, measurement of, A., 592.  
 with electron tubes, A., 814, 999.  
 in dilute aqueous solutions, A., 342.  
 absolute null point of, A., 999.  
 curves of, for diatomic molecules, A., 788.  
 difference of, at liquid-liquid junctions, A., 230.  
 of separate half-elements, influence of temperature on, A., 24.  
 electrode, A., 227.  
 electrokinetic, A., 224, 460, 804.  
 difference of, A., 911.  
 electrostatic, at the phase boundary electrolyte-electrode, A., 343.  
 electrolytic reduction, of organic compounds, A., 231.  
 equivalence, determination of, A., 24.  
 excitation, of light metals, A., 316.  
 ionisation, in relation to atomic number, A., 788.  
 liquid junction, A., 700.  
 minimum, influence of salts on, A., 789.  
 oxidation-reduction, A., 85, 472.  
 phase-boundary, and dielectric constants, A., 1000.  
 photo-electric, production of, A., 1076.  
 spark, in pure gases, A., 441.  
 streaming, determination of, on glass capillaries, A., 337.  
 in relation to capillary width, A., 995.  
 of salt solutions in capillaries, A., 699.  
 surface molecular, relation of dielectric constant of medium and, A., 224.  
 thermodynamic. See under Thermodynamic.  
**ζ-Potential**, A., 700.  
*Potentilla*, tormentil in, A., 665.  
*Potentilla reptans* and *verna*, carbohydrates in, A., 888.  
**Potentiometer**, vacuum tube, for glass electrodes, A., 1225.  
**Pottery**, manufacture of, (P.), B., 182.  
 kilns for, (P.), B., 726.  
 use of town gas in, B., 799.  
 liquid fuel furnaces for heating of, (P.), B., 1012.  
 ovens for firing of, (P.), B., 452.  
**Pottery slip**, continuous filtering and drying of, B., 936.  
**Poultry**, value of milk for feeding, A., 783.  
 efficiency of proteins in feeding of, A., 771.  
 mineral nutrition in, A., 962.  
 vitamin-E requirements of, A., 783.  
 determination of uric acid in excrement from, A., 1156.  
**Powders**, cooling of, in rotating cylinders, B., 1011.  
 sedimentation and flocculation of, in liquids, A., 333.  
 electrical conductivity of, A., 9, 898.  
 colloidal, adsorption of solutions by, A., 458.  
 double-base, explosion-time test of, B., 289.  
 ferromagnetic. See under Ferromagnetic.  
 smokeless. See under Explosives.  
**Po-yoak oil**, B., 194.  
**Praseodymium**, emission of, in alkaline-earth phosphors, A., 110, 321.  
 crystal structure of, A., 681.



Praseodymium nitrate, thermal decomposition of, in carbon dioxide, A., 132.  
 selenate, solubility of, in water, A., 1083.  
 sulphate, magnetic susceptibility of, A., 448.  
 sodium sulphates, A., 132.  
 Precious stones, synthetic, treatment of, (P.), B., 423.  
 Precipitates, formation and properties of, A., 574, 802, 908.  
 washing apparatus for, A., 357.  
 use of sand in centrifuging, A., 594.  
 crystalline, formation and properties of, A., 457.  
 isoelectric, properties of, A., 463.  
 Precipitation, A., 1011.  
 mechanism of, A., 132, 351, 584.  
 electrical, apparatus for, (P.), B., 433.  
 periodic, A., 122, 336, 464, 693.  
 spiral, A., 122.  
 See Co-precipitation.  
 Precipitation apparatus, electrostatic, liquid seals for, (P.), B., 213.  
 Precipitin reaction, specific, A., 884.  
 Predazzite, composition of, A., 1229.  
 Pre-dissociation, dependence of, on temperature, A., 324.  
 increase of, by collision, A., 791.  
 Pregnan, A., 54.  
 Pregnancy, diet in, in relation to low blood-serum-calcium at lactation, A., 1158.  
 intake of food in, A., 297.  
 prolongation of, A., 1173.  
 hepatic function in, A., 82.  
 alkalosis in, A., 1280.  
 calcium, nitrogen and phosphorus balance in, A., 187.  
 effect of vigilant on serum-calcium and -phosphorus in, A., 537.  
 chlorides in sweat, blood, and urine in, A., 82.  
 hormonal reaction for, A., 308.  
 iron content of organs in, A., 187.  
 iron retention in, A., 961.  
 lactic acid metabolism of placenta in, A., 961.  
 mineral metabolism in, A., 1280.  
 pituitary hormone in blood in, A., 768.  
 antidiuretic component of posterior pituitary hormone and pressor substance in blood in, A., 536.  
 posterior pituitary hormone in relation to toxicosis of, A., 873.  
 variation of constituents of serum during, A., 642.  
 change in blood-thyroid hormone in, A., 768.  
 in cows, blood and vegetative nervous system during, A., 961.  
 in swine, food requirements of, A., 643.  
 abnormal, acid-base equilibrium in, A., 1280.  
 Pregnanediol, and its derivatives, A., 54.  
 Prelinite, structure of, A., 1079.  
 Preservatives, effect of, on digestion in man, A., 91.  
 relation of  $p_H$  to toxicity of, to micro-organisms, B., 446.  
 for foods, etc., (P.), B., 1058.  
 Pressure, device for control of, A., 925.  
 automatic control of, (P.), B., 454.  
 apparatus for, (P.), B., 452.  
 lined tank resistant to, (P.), B., 580.  
 metal vessels to withstand, (P.), B., 1012.  
 high, measurement of, A., 1014; B., 291.  
 low, measurement of, A., 246.  
 partial, isotherms of, A., 117, 330.  
 Priming compositions, manufacture of, (P.), B., 1010.

Printing, plant for production of varnishes for, (P.), B., 154.  
 of animal fibres with vat dyes, (P.), B., 545.  
 of cotton with sulphur dyes, (P.), B., 839.  
 with vat dyes, (P.), B., 798.  
 of textiles, (P.), B., 19, 257, 463, 932.  
 with sulphur dyes, (P.), B., 1076.  
 with vat dyes, (P.), B., 503, 544, 640.  
 with vat and sulphur dyes, (P.), B., 1117.  
 of textile fabrics, (P.), B., 769.  
 of viscose silk with acid dyes, B., 1026.  
 with alizarin-red and -pink on non-oiled fabrics, B., 640.  
 with diazo-compounds on naphthol-prepared fabrics, B., 640.  
 with vat dyes, (P.), B., 418, 226.  
 with thioindigo vat dyes, (P.), B., 463.  
 discharge, (P.), B., 19, 226.  
 of fabrics in half-tones, (P.), B., 258.  
 of textile materials, (P.), B., 932.  
 with basic dyes, B., 640.  
 with indigo, B., 596.  
 intaglio, ink for, (P.), B., 687.  
 lithographic, theory of, B., 996.  
 plates for, (P.), B., 528.  
 offset, transfer paper for, (P.), B., 838.  
 photographic. See Photographic printing.  
 planographic, bases for, (P.), B., 416.  
 roller, of fabrics, (P.), B., 20.  
 Printing pastes, production of, from basic dyes, (P.), B., 883.  
 coloured, (P.), B., 721.  
 Printing plates, preparation of, (P.), B., 688.  
 aluminium, photochemical production of, (P.), B., 624.  
 electroplating of, with zinc, (P.), B., 351.  
 Printing presses, make-ready elements for, (P.), B., 1092.  
 Printing works, treatment of dermatitis in, B., 1117.  
 Prism, polarisation, ultra-violet transparent, A., 896.  
 Procaine borate, B., 48.  
 Prodigiosin, A., 1043.  
 Progynon, action of, A., 97.  
 Projectiles, delay powder for, (P.), B., 81.  
 Prolan, effect of, on blood constituents, A., 432.  
 magnesium content in blood-corpuscles after injection of, A., 1068.  
 excretion of, in urine, A., 655.  
 Proline, oxidation of, by liver, A., 775.  
 and hydroxy-, determination of, in proteins, A., 1050.  
 Proline-N-sulphonic acid, and its potassium salt, A., 1023.  
 Pro-lipase, pancreatic, activation of, A., 1278.  
 dl-Prolylglycine, A., 1064.  
 dl-Prolylglycylglycine, A., 1064.  
 Propaldehyde, photolysis of, A., 1006.  
 diethyl-, dimethyl- and methylethyl-acetals, A., 1132.  
 nitrophenylhydrazones, A., 402.  
 Propaldehyde,  $\omega$ -nitro- $\alpha$ -hydroxy-, phenylhydrazone, A., 497.  
 Propane, reactions in cracking of, A., 27.  
 effect of electrostatic field on flames of, A., 358.  
 heat of adsorption of, on sodium chloride, and on potassium permanganate, A., 459.  
 reaction of, with oxygen, A., 1001.  
 determination of, in mixtures with hydrogen, methane, and ethane, A., 241.

Propane,  $\alpha\beta$ -diamino-, di-m-nitrobenzoyl derivative, A., 728.  
 $\alpha$ -amino- $\alpha\beta$ -trioximino-, A., 1267.  
 l-Propane,  $\alpha\beta$ -diamino-, derivatives of, A., 606.  
 cycloPropane, Raman spectrum of, A., 109.  
 action of radon on, A., 918.  
 derivatives, A., 267.  
 cycloPropane, 1:1-dihydroxy-, A., 1249.  
 cycloPropanes, preparation of, A., 606.  
 Raman effect and constitution of, A., 675.  
 cycloPropane series, A., 1249.  
 cycloPropanecarboxylic acid, derivatives of, A., 1249.  
 cycloPropane-1:2-dicarboxylic-2-acetic acid, methyl ester, A., 1144.  
 Propanesulphonic acid,  $\beta$ -hydroxy- $\gamma$ -thiol-, sodium antimony salt, A., 878.  
 sodium bismuth salt, A., 192.  
 Propane- $\alpha\gamma$ -tricarboxylic acid,  $\alpha$ -amino-, benzoyl derivative, ethyl ester, A., 150.  
 isoPropanol, absolute, preparation of, A., 598.  
 Propanone, condensation products of, A., 1236.  
 cycloPropanone, A., 1249.  
 hydrate. See cycloPropane, 1:1-dihydroxy-.  
 4-( $\beta\gamma$ - $\Delta\beta$ -Propenyl)-2:5-dimethyloxazole, 4- $\beta\gamma$ -diamino-, and 4- $\beta\gamma$ -di-m-nitroamino-, dibenzoyl derivatives, A., 625.  
 2-isoPropenylfuran, and its dimeride, A., 1255.  
 1-isoPropenyl-naphthalene, dimeride of, A., 374.  
 Propenylpropion-N,N'-diethylamidine,  $\alpha$ -chloro-, and its chloroplatinate, A., 371.  
 $\Delta^a$ -Propinene, preparation and physical properties of, A., 40.  
 Propionic acid, extraction of, from aqueous solution by light petroleum, A., 331.  
 specific heat of aqueous solutions of, A., 1091.  
 partition of, between water and toluene, A., 1198.  
 alkali salts, fused, electrolysis of, A., 1213, 1214.  
 acid potassium salt, A., 1018.  
 butylidene ester, decomposition of, A., 702.  
 p-chlorophenacyl ester, A., 744.  
 $\beta$ -phenylethylaminoethyl ester, hydrochloride of, A., 846.  
 o- $\beta$ -phenylpropionamidophenyl ester, A., 1026.  
 spinasteryl ester, A., 381.  
 disubstituted derivatives, containing a cyclohexyl group, configurational relationship of, A., 1028.  
 determination of, A., 1051.  
 Propionic acid,  $\alpha$ -amino-,  $\beta\gamma$ -dihydroxy-propyl ester. See dl-Alanylglyceride.  
 phenyl ester, hydrochloride of, A., 936.  
 $\alpha\beta$ -diamino-, dissociation constants of, A., 726.  
 $\alpha$ -bromo-, and  $\alpha$ -oximino-, isopropylideneglyceryl and glyceryl esters, and their benzoyl derivatives, A., 599.  
 N-bromoamino-, ethyl ester, A., 937.  
 aa-dichloro- $\beta$ -hydroxy-, A., 721.  
 $\alpha$ -cyano-, chloride, A., 526.  
 $\alpha$ -thiol-, oxidation of, by hydrogen peroxide, A., 932.  
 l-Propionitrile,  $\alpha$ -amino-, derivatives of, A., 606.  
 3-Propionoxy-2-methyl-1-thionaphthen, and its 1-dioxide, A., 64.  
 Propionyl-dl-alanyl-dl-alanine,  $\alpha$ -bromo-, A., 503.

- Propionylcholine, hydrolysis of, A., 967.  
*N*-Propionylglucosamine, *N*- $\alpha\alpha'$ -diamino-,  $\alpha'$ -propionyl derivative, A., 837.  
 Propionylmethylstyrene,  $\alpha$ -bromo-, and *mono*- and *di*-bromo-3:5-dinitro-, A., 1133.  
 1-Propionylmethylcyclohexane-1-acetic acid, and its derivatives, A., 738.  
 1-Propionylmethylcyclopentane-1-acetic acid, and its derivatives, A., 738.  
*o*-Propionylphenoloxime, A., 157.  
 Propionylphthalimide, A., 849.  
 Propionylpropion-*NN'*-diethylamidine, and its salts, A., 371.  
 Propiophenone 2:4-dinitrophenylhydrazine, A., 1239.  
 2-Propiothienoneindopheninesulphonic acid, A., 752.  
 Propolis, B., 392.  
*iso*Propoxyacetic acid, and its esters and chloride, A., 1019.  
*o*-Propoxybenzhydramines, and their hydrochlorides, A., 52.  
*o*-Propoxybenzphenones, and their derivatives, A., 52.  
 *$\alpha$* -*n*-Propoxy- $\beta\beta\beta$ -tribromoethylcarbamide, A., 1114.  
 3-*iso*Propoxydimethylaniline, 4-nitroso-, and its hydrochloride, A., 510.  
 *$\alpha$* -Propoxyethylcarbamides,  $\beta\beta\beta$ -trichloro-, A., 151.  
*n*-Propoxymethyl methyl and ethyl ethers, A., 1233.  
 Propoxyphenol, *o*- $\beta\gamma$ -dihydroxy-, A., 510.  
 3-*iso*Propoxyphenols, nitroso-, A., 509.  
 4-Propoxy-pyridine-2:6-dicarboxylic acid, 3:5-diiodo-, and its methyl ester, A., 622, 623.  
*n*-Propyl alcohol, surface tension of mixtures of, with benzene, A., 330.  
 catalytic oxidation of, A., 1096.  
 effect of temperature on hemolytic systems containing, A., 1273.  
 determination of, in mixtures of ethyl alcohol and water, A., 1149.  
*iso*Propyl alcohol, mixture isotherms for, with water, A., 332.  
 use of, as denaturant for ethyl alcohol, B., 42.  
 determination of, in ethyl alcohol, B., 250.  
*n*-Propyl bromide, synthesis of *n*-hexane from, A., 1108.  
*tert*.-butyl ether, A., 719.  
*n*-butyloxymethyl ether, A., 1233.  
 chloride, molecular structure of, A., 794.  
*N*-diphenyl- and *N*-*p*-nitrophenyl-urethanes, A., 1239.  
 ether, dipole moment of, A., 561.  
 hydrogen peroxides, and their salts, A., 363.  
 mercaptan, additive compound of, with formaldehyde, A., 1114.  
*o*-phenylene disphosphate, A., 379.  
*o*-phosphates, dichloro-, A., 364.  
*iso*Propyl sulphate, A., 363.  
*iso*Propylacetylene, catalytic hydrogenation of, A., 1231.  
 $\beta$ -Propyladipic acids, configuration of, A., 43.  
*iso*Propylallylbarbituric acid, polymorphism of, A., 404.  
 anæsthetic action of, A., 88.  
 Propylallyl-1-phenyl-3-methylbarbituric acid, A., 283.  
 Propylamine, complex compounds of lithium halides and, A., 124.  
*iso*Propylamine, thermal decomposition of, A., 474.  
 8-*iso*Propylamine-6-chloro-2-methylquinoline, 8- $\alpha$ -amino-, dihydrochloride, A., 522.  
 8-*iso*Propylamine-6-chloroquinoline, 8- $\alpha$ -amino-, dihydrochloride, A., 522.  
 8-*iso*Propylamine-6-ethoxy-2-methylquinoline, 8- $\alpha$ -amino-, dihydrochloride, A., 522.  
 8-*iso*Propylamine-2-methylquinoline, 8- $\alpha$ -amino-, dihydrochloride, A., 522.  
 8-*iso*Propylamine-6-ethoxyquinoline, 8- $\beta$ -amino-, dihydrochloride, A., 281.  
 8- $\beta$ -hydroxy-, hydrochloride, A., 1040.  
*iso*Propylamine-6-methoxy-2-methylquinoline, 8- $\alpha$ -amino-, dihydrochloride, A., 522.  
 8-*iso*Propylamine-6-methoxyquinolines, 8- $\alpha$ -amino-, dihydrochlorides, A., 281, 522.  
 8-*iso*Propylamine-6-methylquinoline, 8- $\beta$ -amino-, dihydrochloride, A., 281.  
 4-Propylaminophenylarsinic acid, 3-amino-, and 3-nitro-, A., 1049.  
*n*-Propylaminoquinoline, 8- $\gamma$ -amino-, dihydrochloride, A., 281.  
 8- $\beta$ -hydroxy-, hydrochloride, A., 1040.  
*n*-Propyl *n*-amyl ketone, A., 254.  
*iso*Propylaniline, A., 1143.  
*iso*Propyl-1:2-benzanthracenes, and their derivatives, A., 374.  
 $\beta$ -*iso*Propyl- $\Delta^{\alpha\gamma}$ -butadiene, A., 43.  
 $\beta$ -*iso*Propylbutane,  $\alpha\delta$ -diamino-, and its derivatives, and  $\alpha\delta$ -dibromo-, A., 43.  
 $\beta$ -*iso*Propyl- $\Delta^{\beta}$ -butene,  $\alpha\delta$ -dibromo-, A., 43.  
*iso*Propyl*tert*.-butylcarbinol, dehydration of, A., 1109.  
*cyclo*Propylbutylcarbinols, A., 267.  
*cyclo*Propylcarbamic acid, methyl ester, A., 1249.  
*trans*-*a*-*n*-Propylcinnamic acid, and its dibromide, A., 268.  
 5-*iso*Propyl-*m*-cresol tetrabromide, A., 62.  
 $\beta$ -Propylcrotononitrile, A., 1119.  
*cyclo*Propyldibutylcarbinols, A., 267.  
*cyclo*Propyldiphenylcarbinol, and its derivatives, A., 1249.  
*(cyclo*Propyldiphenylmethyl)dimethylaniline, and its derivatives, A., 1249.  
*N*-(*cyclo*Propyldiphenylmethyl)pyridinium bromide, A., 1249.  
*cyclo*Propyldiisopropylcarbinol, A., 267.  
 Propylene, pyrolysis of, (P.), B., 670.  
 action of radon on, A., 918.  
 equilibrium of, with carbon dioxide and with methyl ether, A., 800.  
 reaction of, with oxygen, A., 815.  
 condensation of, with phenol, in presence of boron fluoride, A., 1125.  
 dibromide, reaction of, with potassium iodide, A., 475.  
 calorimetric determination of, in gas mixtures, B., 247.  
 Propylene glycol, properties and toxicity of, A., 425.  
 Propylene oxide, oxygen valency angle and electric moment of, A., 1190.  
*cyclo*Propylethylcarbinol, A., 267.  
 2-*iso*Propylfuran, synthesis of, A., 1255.  
 2-*iso*Propylfuran-3-carboxylic acid, ethyl ester, A., 1255.  
 5-*iso*Propylfurfuraldehyde, synthesis of, and its semicarbazone, A., 1255.  
 5-*iso*Propyl-2-furoic acid, A., 1255.  
 Propylpharmol, pharmacology of, A., 647.  
 $\delta$ -Propylheptan- $\gamma$ -one, A., 368.  
 $\gamma$ -Propylhexan- $\beta$ -one semicarbazone, A., 368.  
*iso*Propylidene groups, determination of, microchemically, A., 1111.  
 1:2-*iso*Propylidene-3:5-benzylideneglucosufuranose, A., 1115.  
 1:2-*iso*Propylidene-3:5-benzylideneglucose 6-acetate and 6-benzoate, A., 1115.  
 8-*a*-amino-, dihydrochloride, A., 522.  
 8-*a*-amino-, dihydrochloride, A., 522.  
 8- $\alpha$ -amino-, dihydrochloride, A., 522.  
 8- $\beta$ -amino-, dihydrochloride, A., 281.  
 8- $\beta$ -hydroxy-, hydrochloride, A., 1040.  
*iso*Propylidene-6-methoxy-2-methylquinoline, 8- $\alpha$ -amino-, dihydrochloride, A., 522.  
 8-*iso*Propylidene-6-methoxyquinolines, 8- $\alpha$ -amino-, dihydrochlorides, A., 281, 522.  
 8-*iso*Propylidene-6-methylquinoline, 8- $\beta$ -amino-, dihydrochloride, A., 281.  
 4-Propylaminophenylarsinic acid, 3-amino-, and 3-nitro-, A., 1049.  
*n*-Propylaminoquinoline, 8- $\gamma$ -amino-, dihydrochloride, A., 281.  
 8- $\beta$ -hydroxy-, hydrochloride, A., 1040.  
*n*-Propyl *n*-amyl ketone, A., 254.  
*iso*Propylaniline, A., 1143.  
*iso*Propyl-1:2-benzanthracenes, and their derivatives, A., 374.  
 $\beta$ -*iso*Propyl- $\Delta^{\alpha\gamma}$ -butadiene, A., 43.  
 $\beta$ -*iso*Propylbutane,  $\alpha\delta$ -diamino-, and its derivatives, and  $\alpha\delta$ -dibromo-, A., 43.  
 $\beta$ -*iso*Propyl- $\Delta^{\beta}$ -butene,  $\alpha\delta$ -dibromo-, A., 43.  
*iso*Propyl*tert*.-butylcarbinol, dehydration of, A., 1109.  
*cyclo*Propylbutylcarbinols, A., 267.  
*cyclo*Propylcarbamic acid, methyl ester, A., 1249.  
*trans*-*a*-*n*-Propylcinnamic acid, and its dibromide, A., 268.  
 5-*iso*Propyl-*m*-cresol tetrabromide, A., 62.  
 $\beta$ -Propylcrotononitrile, A., 1119.  
*cyclo*Propyldibutylcarbinols, A., 267.  
*cyclo*Propyldiphenylcarbinol, and its derivatives, A., 1249.  
*(cyclo*Propyldiphenylmethyl)dimethylaniline, and its derivatives, A., 1249.  
*N*-(*cyclo*Propyldiphenylmethyl)pyridinium bromide, A., 1249.  
*cyclo*Propyldiisopropylcarbinol, A., 267.  
 Propylene, pyrolysis of, (P.), B., 670.  
 action of radon on, A., 918.  
 equilibrium of, with carbon dioxide and with methyl ether, A., 800.  
 reaction of, with oxygen, A., 815.  
 condensation of, with phenol, in presence of boron fluoride, A., 1125.  
 dibromide, reaction of, with potassium iodide, A., 475.  
 calorimetric determination of, in gas mixtures, B., 247.  
 Propylene glycol, properties and toxicity of, A., 425.  
 Propylene oxide, oxygen valency angle and electric moment of, A., 1190.  
*cyclo*Propylethylcarbinol, A., 267.  
 2-*iso*Propylfuran, synthesis of, A., 1255.  
 2-*iso*Propylfuran-3-carboxylic acid, ethyl ester, A., 1255.  
 5-*iso*Propylfurfuraldehyde, synthesis of, and its semicarbazone, A., 1255.  
 5-*iso*Propyl-2-furoic acid, A., 1255.  
 Propylpharmol, pharmacology of, A., 647.  
 $\delta$ -Propylheptan- $\gamma$ -one, A., 368.  
 $\gamma$ -Propylhexan- $\beta$ -one semicarbazone, A., 368.  
*iso*Propylidene groups, determination of, microchemically, A., 1111.  
 1:2-*iso*Propylidene-3:5-benzylideneglucosufuranose, A., 1115.  
 1:2-*iso*Propylidene-3:5-benzylideneglucose 6-acetate and 6-benzoate, A., 1115.  
 Propylidenebisdi-indone, A., 1252.  
 Propylidenebisdimethyldihydroresorcinol, A., 1235.  
 Propylidenebisthiolacetic acid, A., 1235.  
*o*-Propylidenedioxybenzene, A., 860.  
 4:5-*iso*Propylidenedioxycyclohexanone, and its derivatives, A., 850.  
 4:5-*iso*Propylidenedioxy-1-methylcyclohexane, 1:3-dihydroxy-, and its hydrate, A., 850.  
*iso*Propylidene-glucose, oxidation of, and its potassium derivative, 3-sulphate of, A., 148.  
 3-phosphate, constitution of, and its triphenylmethyl ester, A., 143.  
 4:5-*iso*Propylidene-cyclohexyldimethylcarbinol, 1:3:4:5-tetrahydroxy-, and its derivatives, A., 850.  
*iso*Propylidenemalonic acid, ethyl ester, A., 1143.  
*iso*Propylidenemannitol, 1:6-dichloro-, and its diacetate, A., 834.  
 $\gamma\delta$ -*iso*Propylidenemannitol, and its  $\alpha\zeta$ -dibenzoate, A., 929.  
 $\Delta^1$ -4-*iso*Propylidenemethylcyclohexen-3-ol. See  $\Delta^1$ -Dehydroisopulegol.  
 4:5-*iso*Propylidenequinhydrazide, A., 850.  
*iso*Propylidenequinic acid, derivatives of, A., 850.  
*iso*Propylidenexyluronic-3-sulphuric acid, dipotassium salt, A., 148.  
*n*-Propylmalonic acid,  $\beta\gamma$ -dihydroxy-, and its  $\gamma$ -acetyl derivative, derivatives of, A., 833.  
*cyclo*Propylmethylisobutylcarbinol, A., 267.  
*cyclo*Propylmethylcarbinol, and its acetyl derivative, A., 267.  
 3-*iso*Propyl-6-methyl-2-hydroxydiphenylmethane, 5-chloro-, and its antibacterial action, A., 1026.  
 1-*iso*Propylnaphthalene, and its picrate, A., 374.  
 6-*iso*Propyl-2-naphthoic acid, and its methyl ester, A., 839.  
 4'-*iso*Propyl-1'-naphthoyl-2-benzoic acid, A., 374.  
 $\beta$ -(6-Propyl-2-naphthoyl)propionic acid, A., 839.  
 $\beta$ -(6-*iso*Propyl-2-naphthoyl)propionic acid, and its methyl ester, A., 839.  
 $\gamma$ -(6-*iso*Propyl-2-naphthyl)- $\Delta^{\beta}$ -pentenoic acid, A., 839.  
 Propyl-3-nitrophthalimide, A., 1231.  
*iso*Propyl- $\alpha$ -oximinoethyl ketone, A., 602.  
 2-*iso*Propylphenmethopholone, A., 1145.  
*p*-*iso*Propylphenol, tetranitro-, A., 378.  
*p*-Propylphenol-2-sulphonic acid, salts of, A., 943.  
 Propylphenoxypropylmalonic acid, ethyl ester, A., 366.  
 5-Propyl-1-phenyl-3-methylbarbituric acids, A., 283.  
 4-*iso*Propylphenylthiocarbimide, A., 154.  
 Propylphthalide, 3:4:5-trihydroxy-2- $\alpha\alpha\beta$ -trichloro-, and its triacetate, A., 848.  
 $\beta$ -*iso*Propylpropane,  $\alpha\gamma$ -diamino-, diacetyl derivative, A., 256.  
*cyclo*Propyl-*n*-propylcarbinol, A., 267.  
*cyclo*Propylisopropylethylcarbinol, A., 267.  
 $\beta$ -Propylstyrene,  $\beta$ -bromo-, A., 269.  
*a*-*n*-Propylstyryl methyl ketone, and its oxime, A., 268.  
 4-*iso*Propylthiocarbamide, A., 154.  
 2- and 3-*iso*Propylthiophen, production of, B., 297.  
 $\alpha$ -Propylvaleric acid, lactone of, and  $\delta$ -bromo-, A., 366.  
*iso*Propylxanthic acid, copper salt, A., 718.  
 Prosplen, hormonal nature of, A., 1171.  
 effect of, on blood-sugar, A., 547.

**Prostigmine**, detection of, microchemically, A., 1267.

**Proteases**, nature of, A., 193, 194.  
 of animal tissues, A., 91, 1153.  
 animal, A., 1052, 1053.  
 bacterial, A., 197, 429.

**Proteins**, A., 227.  
 structure of, A., 529, 1148.  
 synthesis and degradation of, A., 867.  
 enzymic synthesis of, A., 193.  
 recovery of, from industrial waste, (P.), B., 530.  
 histamine in, and its isolation, A., 529.  
 nitrogen content of, A., 1291.  
 distribution of sulphur in, A., 1149.  
 physical chemistry of, A., 73, 338, 911.  
 refractivity of solutions of, A., 804.  
 streaming double refraction of solutions of, A., 121.  
 ultra-violet absorption spectra of amino-acids in, A., 212.  
 electrokinetics of, A., 695.  
 ionic activity of, A., 20.  
 mobility of ions of, A., 1088.  
 viscosity of sols of, A., 465.  
 properties of films of, A., 120, 1085.  
 films of, in oil-water emulsions, A., 464.  
 monolayers of, A., 909.  
 stability and osmotic swelling of, A., 807.  
 solubilities of, A., 1084.  
 properties of, in organic solutions, A., 1088.  
 relation of, to colloids and electrolytes, A., 122.  
 colloidal and constitutive changes in, A., 807.  
 electrophoresis of, A., 21.  
 precipitation of, by iron and thorium from biological fluids, A., 1276.  
 water-soluble sulphonic acid of unsaturated hydrocarbons as precipitant for, (P.), B., 1069.  
 effect of salts on isoelectric point of, A., 21.  
 phase-rule studies on, A., 694, 996.  
 decomposition of, by micro-organisms, A., 968.  
 feeding experiments with decomposition products of, A., 643, 1060.  
 degradation of, A., 1050.  
 by ultra-violet light, A., 1098.  
 denaturation of, A., 181, 694, 1088.  
 denaturation and viscosity of, A., 227.  
 parenteral denaturation of, A., 189, 869.  
 detection of norvaline in fission products of, A., 954.  
 dilatometric measurement of hydration of, A., 20.  
 colour reaction of, with alloxan, A., 410.  
 combination of, with amylopectin, A., 501.  
 with nucleic acids, etc., A., 1089.  
 reactions of, with dyes, A., 227.  
 with gold sols, A., 996.  
 constitution of bases from, and their derivatives, A., 285, 624.  
 conjugated carbohydrate compounds of, A., 957.  
 compounds of, with uric acid, A., 227.  
 attachment of heavy metals to, A., 1149.  
 hardening of plastic masses of, (P.), B., 949.  
 production of threads, films, etc. from solutions of, (P.), B., 595.  
 biological value of, for avian nutrition, A., 1060.  
 functions of intestine and liver in digestion of, A., 299.  
 formation of urinary creatine and purines on diet of, A., 84.

**Proteins**, excretion of, in urine, A., 639.  
 alkali-treated, immunological properties of, A., 1153.  
 animal and vegetable, electrometric analysis of, A., 694.  
 Bence-Jones, A., 537.  
 crystalline, isoelectric point of, A., 1057.  
 detection of, in urine, A., 296.  
 conjugated carbohydrate, chemo-immunology of, A., 197.  
 in fish meals, B., 701.  
 ingested, utilisation of, by normal and depancreatised dogs, A., 81.  
 of milk. See under Milk.  
 native, molecular weights of, A., 74.  
 p.c.a., peptisation of, A., 1202.  
 plasma. See under Plasma.  
 serum. See under Serum.  
 vegetable, A., 84.  
 electrochemical analysis of, A., 71, 182, 465.  
 Van Slyke analysis of, A., 1239.  
 colour reaction and fluorescence of, in presence of diacetyl, A., 1148.  
 determination of, by precipitation, A., 1273.  
 microchemically, in cereal products, B., 621.  
 in flour, B., 1051.  
 determination in, of alanine, microchemically, A., 1050.  
 of amino-acids, A., 438, 637.  
 of cystine, A., 206.  
 of methionine, A., 1149.  
 of polypeptides, A., 182.  
 of proline and hydroxyproline, A., 1050.

**Proteins**, iodo-, effect of hydrolytic products of, on development and regeneration, A., 190.

**Proteinases**, separation of carboxypolypeptidases and, B., 239.

***Proteus vulgaris***, polysaccharides of, A., 545.

**Protoactinium**, half-life period of, A., 895.  
 chemical reactions of, A., 443.  
 precipitation of, by ammonia, A., 919.

**Protocatechualdehyde**, manufacture of, (P.), B., 138.

**Protolichestic acid**, constitution of, and its derivative with diazomethane, A., 931.

**Protons**, structure and properties of, A., 672.  
 mass of, A., 107, 443, 444.  
 and electromagnetism, A., 980.  
 fast, production of, A., 317.  
 emission of, by action of  $\gamma$ -rays on substances containing hydrogen, A., 210.

**Protophaeoporphyrins**, A., 1265.

**Protoplasm**, influence of rotation of, on transport of substances, A., 205.  
 biophysical chemistry of, A., 808.

**Protoplasts**, isoelectric point of, A., 1296.

**Protoporphyrin**, silver salt, A., 626.

**Protosinomenine**, synthesis of, A., 175.

**Prunes**, Californian, dried, composition of, B., 1103.  
 canned, vitamins in, B., 655.

**Pruritus**, action of potassium salts on, A., 1159.

**Prussian blue**, constitution of, A., 32.  
 analysis of, B., 851.

***Psalliotia campestris***, chitin from, A., 975.

**Psicaine**, detection of, B., 1007.

**Psilomelane**, nature of, A., 1229.

**Psychosis**, acid-base equilibrium in, A., 769.  
 $pH$  of blood in, A., 1280.

**Psychosis**, psycho-galvanic reflex and hyperglycemic index in, A., 1057.  
 functional, dispersion in, A., 297.

***Pteria vulgaris***, isolation of uroporphyrin from, A., 285.

**Ptilolite** from Utah, A., 1228.

**Ptyalin**, destruction of, A., 427.

***Ptychosperma elegans***, lycopene in fruit of, A., 1178.

**Puberulic acid**, and its derivatives, A., 651.

**Puerperal sepsis**, vitamin-A in liver in, A., 1293.

**dl-Puketaine methyl ether**, and its resolution, A., 526.

**Pulegone**, determination of, in peppermint oil, B., 1055.

**Pulp**, production of, (P.), B., 1025.  
 from bagasse, etc., (P.), B., 501.  
 from cellulose materials, (P.), B., 768.  
 from farm waste, (P.), B., 720.  
 corrosion-resistant plant for, B., 1085.  
 production of pitch in, B., 837.  
 and treatment of residual liquors, (P.), B., 882.  
 recovery of chemicals from, (P.), B., 720.  
 control of sulphite boiling of, by viscosity, B., 717.  
 preconditioning of cooking solutions for, (P.), B., 796.  
 digesters for, (P.), B., 881, 930.  
 directly-heated digester for, (P.), B., 224.  
 loss in yield and quality of, in unclean digesters, B., 302.  
 influence of sulphite digestion on length of fibres in, B., 16.  
 recovery of alkalis from waste liquors from, B., 883.  
 recovery of soda from black liquors from, B., 178.  
 utilisation of spent cooking liquors from, (P.), B., 502.  
 refining engines for, (P.), B., 18.  
 combined bleaching of, B., 141.  
 washers for, (P.), B., 756.  
 automatic regulation of concentration of, (P.), B., 244.  
 regulation of consistency of, (P.), B., 964.  
 floccility and springback of, B., 717.  
 chemical treatment of, (P.), B., 501.  
 determination of degree of decomposition of, B., 223.  
 determination of degree of decomposition and strength of, B., 380.  
 measurement of freeness of, (P.), B., 543.  
 measurement of hydration of, by the boiling method, B., 255.  
 hydrolysis of, B., 177.  
 spraying of, (P.), B., 3.  
 apparatus for production of articles from, (P.), B., 639.  
 forming and testing of sheets of, B., 674.  
 production of composite sheets of, (P.), B., 797.  
 fibrous, production of moulded articles from, (P.), B., 1075.  
 kraft, from spruce and pine wood, B., 96.  
 bleaching of. See under Bleaching.  
 puffed, production of, (P.), B., 720.  
 determination of iodine value of, B., 638.

**Pulp board**, fire-resistant, manufacture of, (P.), B., 596.

**Pulses**, alimentary values of, compared with those of cereals, A., 772.

**Pulverisation apparatus**, (P.), B., 132, 453, 532.

**Pulverisers**, (P.), B., 3, 5\*, 85, 164, 212, 405, 821, 1012.  
 air separator for, (P.), B., 869.  
 for coal, etc., (P.), B., 244.  
 hammer, (P.), B., 292.

- Pumice**, Armenian, use of, in glass, B., 422.
- Pumps**, for compressed gases, B., 915.  
for gases and liquids, B., 1059.  
centrifugal, design and use of, B., 1107.  
diffusion and molecular, B., 755.  
mercury, vapour trap for, A., 1227.  
for gas analysis apparatus, A., 138.  
laboratory, A., 1014.  
vapour, A., 1105.  
screw, using viscous liquids, (P.), B., 789.  
vacuum, A., 1105.  
use of organic compounds in, A., 358.  
oil, solvent trap for, B., 921.  
high-vacuum, safety device for, A., 925.  
vapour, electric boiler for, (P.), B., 965.
- Pumpellyite**, Californian, A., 1228.
- Purification**, biological, in nature and industry, A., 968.
- Purines**, effect of drugs on economy of, A., 1162.  
metabolism of. See under Metabolism.  
use of palladous chloride as reagents for, A., 1052.  
and their derivatives, determination of, iodometrically, A., 1150.  
determination of, in tissues, A., 870.
- Purines, hydroxy-**, determination of, in urine, A., 295.  
*NN'*-substituted, A., 283, 524, 756, 1043.
- Purine- $\beta$ -riboside**, 6-amino-2-hydroxy-, and its salts, A., 501.
- Purpurin**, synthesis of, A., 164.
- Pus**, protein of, A., 82.
- Putrescine**, detection of, A., 1150.
- Putty**, lime-containing chalks in manufacture of, B., 601, 679.  
substitute for, (P.), B., 468.
- Puzzuolana**, displacement of alkalis in, by lime, B., 424.  
Roman, spectrographic examination of, B., 422.
- Pyknometer** for determining volume change at electrodes, A., 698.
- Pyocyanine**, effect of, on respiration of cells, A., 90.  
on respiration of normal and tumour tissues, A., 539.
- Pyorrhæa**, phosphorus and magnesium in teeth in, A., 1278.
- Pyrimidone**, compound of, with strontium sulphosalicylate, A., 1284.  
detection in, of antipyrine, B., 816.  
determination of, in presence of caffeine and phenacetin, B., 448.  
volumetrically, in antipyrine, acetanilide, phenacetin, caffeine, etc., B., 960.
- Pyrazine-2:3-dicarboxylic acid**, phthalein dyes derived from, A., 66.
- Pyrazolanthrone dyes**, vat, manufacture of, (P.), B., 379.
- Pyrazoles**, syntheses with, A., 1144.
- Pyrazolinecarboxylic acids**, esters, synthesis of, A., 862.  
alkyl esters, decomposition of, A., 1143.
- Pyrazoline-3:4-dicarboxylic acid**, methyl ester, derivatives of, A., 863.
- Pyrazopyrrolidones**, A., 171.
- Pyrethrins**, comparative efficiency of rotenone and, as contact insecticides, B., 1130.
- Pyrethrum**, development of flowers of, A., 99.  
effect of storage on flowers of, B., 1003.  
chemistry and toxicology of, B., 441.  
manufacture of concentrated extracts of, B., 1136.  
as an insecticide and vermicide, B., 158.  
toxicity of, as indicated by its pyrethrin I content, B., 201.
- Pyrethrum**, loss of toxicity of, on exposure to light and air, B., 697.  
extracts of, as insecticides, B., 783.  
toxicity of, B., 322.  
permanency of toxicity and stability of emulsions of, B., 74.  
analysis of, and fertilisers for the plant, B., 1048.
- Pyridanthrone dyes**, acid, manufacture of, (P.), B., 1115.
- Pyridine**, formation of, from ethyl 1-pyrrylacetate, A., 65.  
Raman spectrum of, A., 213.  
action of ultra-violet light on, A., 1149.  
conductivity measurements in, A., 914.  
density of, A., 906.  
vapour, expansion of charcoal by, A., 1199.  
effect of adsorption on  $p_H$  of solutions of, A., 700.  
equilibrium of, with silver nitrate, A., 810.  
bromination of, at high temperatures, and 2-amino-6-bromo-, and *pentachloro-*, A., 522.  
dehydrogenation of, by anhydrous ferric chloride, A., 284.  
ring fission of, A., 1039.  
mercuration of, and its triiodomercuriate, A., 630.  
oxidation of, electrolytically, A., 401.  
syntheses with, A., 1144.  
reaction of, with alkyl bromides, A., 474.  
compounds of, with aluminium chloride, A., 468.  
with mercuric iodide, A., 622.  
molecular compound of, with 4:6-dichloro-1:3-dinitrobenzene, A., 259.  
derivatives, manufacture of, (P.), B., 1114.  
arsenicals derived from, A., 761.  
methylenesulphate, A., 251.  
detection of, A., 1149.
- Pyridine**, amino-derivatives, acetyl derivatives, methiodides of, A., 622.  
2-amino-, production of, (P.), B., 973.  
reaction of aldehydes with, and its formyl derivative, A., 167.  
2:6-diamino-, production of, (P.), B., 973.  
manufacture of halogen derivatives of, (P.), B., 1008.  
bromo-derivatives, bromination of, catalytically, in the gaseous phase, A., 1260.  
*di-*, *tri-*, *tetra-*, and *penta-*bromo-, and 3:5-dibromo-4-amino-derivatives, A., 1260.  
*dibromo-amino-* and *-thiol*, *trichloro-*, *chloro-dibromo-* and *-diiodo-*, and *dichloro-* and *diiodo-thiol-*, A., 623.  
4:6-dichloro-2-amino-, acetyl derivative, 4:6-dichloro-2-hydroxy-, and 4-chloro-6-iodo-, A., 401.  
2:4:6-trihydroxy-, and its derivatives, A., 526.  
nitro-derivatives, A., 622.  
nitro- $\beta$ -hydroxy-, manufacture of, (P.), B., 251.  
and its alkyl derivatives, (P.), B., 671.
- Pyridines**, alkylated, salts of ammono-enolic modifications of, A., 65.
- Pyridine series**, isomerism in, A., 622.  
electrochemical oxidation in, A., 401, 622, 758.  
Rosenmund aldehyde synthesis in, A., 1039.
- Pyridine-aldehydes**, *dichloro-*, and their phenylhydrazones, A., 1039.
- Pyridine-3-carboxylic acid**, 2:4-dihydroxy-, A., 526.
- Pyridinecarboxylic acids**, production of complex metal compounds of, (P.), B., 973, 1137.
- Pyridinecarboxylic acids**, *thiol-*, A., 1039.
- Pyridine-2:6-dicarboxylic acid**, 3:4:5-*tri-bromo-*, 4-bromo-3:5-*diiodo-*, 3:4:5-*tri-chloro-*, and 4-chloro-3:5-*diiodo-*, and their ethyl esters, A., 623.
- Pyridine-3-nitrile**. See Nor-ricinine.
- Pyridinesulphonic acids**, *dihalogeno-*, A., 623.
- Pyridine-2-sulphonic-3-carboxylic acid**, A., 1039.
- $\delta$ -Pyridinetetracarboxylic acid**, dianhydride of, and its condensation products, A., 402.
- Pyridinium series**, valency isomerism of salts of, A., 950.
- Pyridiniumallyl chloroplatinate**, A., 1261.
- N*-Pyridiniumsulphonic acid**, preparation of, A., 1216.
- $\alpha$ -Pyridinoquinilino-platinous chloride**, A., 1039.
- "Pyridium," sulphæmoglobinæmia after use of, A., 89.
- 4-Pyridone**, 3:5-*diiodo-*, and its *N*-sulpho-derivative, A., 622.  
manufacture of, (P.), B., 817.
- Pyridones**, manufacture of *N*-substituted derivatives of, (P.), B., 13.  
alkyl or aralkyl derivatives of, (P.), B., 764.
- 4-Pyridone-*N*-acetic acid**, 3:5-*diiodo-*, A., 622.
- Pyridonecarboxylic acids**, derivatives of, and 3:5-*di-bromo-* and 3:5-*di-chloro-*, and their derivatives, A., 622.
- 3-Pyridylarsinic acid**, and its hydrochloride, A., 761.
- 2-Pyridylbenzimidazoles**, salts of, A., 1263.
- Pyridylcarbinols**, *dichloro-*, and their benzoyl derivatives, A., 1039.
- 3-Pyridyldichloroarsine hydrochloride**, A., 761.
- 1-2-[ $\beta$ -Pyridyl]-*N*-methylpiperidine methiodide**, A., 177.
- 1-2( $\beta$ -Pyridyl)piperidine**, salts and derivatives of, A., 177.
- 5-(3-Pyridyl)pyrazole**, 4-nitro-, and its salts, A., 68.
- N*-4'-Pyridyl-4-pyridone**, A., 283.
- N*-4'-Pyridyl-4-pyridone**, 3:5:3':5'-*tetra-bromo-*, and 3:5:3':5'-*tetraiodo-*, A., 623.
- 2-( $\beta$ -Pyridyl)pyrrole**, and its pierate, A., 177.
- N*-4'-Pyridyl-4-thiopyridone**, and its *di-perchlorate*, A., 283.
- Pyrimidines**, A., 404, 523, 755, 952, 1144.  
azo-derivatives of, A., 404, 523.  
physiology of, A., 84.
- Pyrimidines**, *NN'*-substituted, A., 283, 524, 756, 1043.
- 1:9-Pyrimidineanthrone**, *C*-amino-, and its salts, A., 405.
- Pyrites**, diagram of state of, A., 563.  
burning of, (P.), B., 22.  
zinc solutions for chloridising roasting of, (P.), B., 841.  
roasting of, (P.), B., 554.  
recovery of sulphur from, (P.), B., 547.  
distinction of, from marcasite, A., 1014.  
arsenical, treatment of, (P.), B., 471.  
analysis of, with chlorine, B., 265, 1121.  
determination in, of sulphur, B., 546.
- Pyrocatechol**, equilibria of, in solutions of barium and calcium chlorides, A., 335.  
reaction of, with acetone, A., 860.  
with phosphorus aryloxy- and alkoxy-dichlorides, A., 379.  
ethers A., 545.

Pyrocatechol niobates and tantalates, A., 484.  
*o*-phosphate, A., 364.  
 Pyrocatechol, tetraamino-, and tetranitro-, and their salts and derivatives, A., 52.  
 4-nitro-, preparation of, and its derivatives, A., 156.  
 Pyrocatechoxide, aluminium, optical activity of, A., 1126.  
 Pyrochollepitanic acid, derivatives of, A., 1248.  
 Pyrocholoidanic acid, derivatives of, A., 1248.  
 Pyroisodeoxybilianic acid, bromo-derivatives of, and their derivatives, A., 1248.  
 Pyrogallol 1:3-dimethyl ether, action of benzoyl chloride on, A., 380.  
 Pyrogallol-lignin, and its acetyl derivative, A., 1296.  
 Pyroguaiacin methyl ether, synthesis of, A., 735.  
 Pyrolusite, determination of depolarising power of, B., 558.  
 decolorisation and colouring of glass with, B., 307.  
 Pyrometers, (P.), B., 820.  
 pivot mounting of, B., 404.  
 optical, (P.), B., 353, 580, 848.  
 two-colour, B., 584.  
 potentiometric, A., 245.  
 Pyrometry, colour, B., 80.  
 photo-electric-tube, B., 291.  
 Pyronorcholoidanic acid, bromo-, and hydroxy-, and its oxidation product, A., 1248.  
 Pyrophosphatase of bone and cartilage, A., 870.  
 malt and yeast, A., 305.  
 Pyrophosphoric acid. See under Phosphorus.  
 Pyroquinovic acid, derivatives of, A., 945.  
 Pyrrohodion-porphyrin methylester, A., 174.  
 Pyrosulphites. See under Sulphur.  
 Pyrotechnics, (P.), B., 578.  
 detonating, (P.), B., 1010.  
 Pyroxene from Hiva Oa, Marquesas Is., A., 494.  
 manganiferous triclinic, A., 1228.  
 monoclinic, crystal structure of, A., 12.  
 Pyroxylin, manufacture of low-viscosity solutions of, (P.), B., 197\*.  
 coating of fabrics with, (P.), B., 839.  
 production of pigmented compositions from, (P.), B., 687.  
 manufacture of plastic sheets from, (P.), B., 881.  
 Pyrrhite, crystal structure of, A., 1079.  
 Pyrrhotite, crystal growths of, A., 682.  
 Pyrrole, oxidation of, catalytically, by hydrogen peroxide, A., 1141.  
 action of ozone on, A., 1142.  
 derivatives, effect of, on formation of haemoglobin, A., 1151.  
 detection of, colorimetrically, A., 868.  
 Pyrrole, tetraiodo-, molecular compound of, with dioxan, A., 719.  
 Pyrroles, synthesis of, and their transformations, A., 281.  
 condensation of, with acetaldehyde, acetone, and phorone, A., 1263.  
 syntheses with, A., 1144.  
 and pyrrole dyes, application of calorimetry to, A., 280.  
 Pyrroles, substituted, synthesis of, A., 621, 861.  
 Pyrrole blacks, structure of, A., 1266.  
 2-Pyrroleazo-*p*-phenylstibinic acid, and its salts, A., 954.  
 Pyrrolidines, 2-substituted, A., 1259.  
 N-substituted, electron-sharing ability and dissociation constants of, A., 167.

4<sup>2</sup>-Pyrrolines, reduction of, electrolytically, A., 1141.  
 Pyrrolines, 2-substituted, A., 1259.  
 Pyrrolones, stability of, to water, A., 521.  
 reduction of, electrolytically, A., 1141.  
 action of Grignard reagents on, A., 621.  
 1-Pyrrolylacetic acid, ethyl ester, formation of pyridine from, A., 65.  
*Pyrus malus*, growth in relation to vegetative and reproductive responses in, A., 1295.  
 Pyruvic acid, formation of, from methylglyoxal, A., 720, 1235.  
 bacterial production of, from lactic acid, A., 429.  
 equilibrium of, with lactic acid, A., 809, 813.  
 condensation of, with aldehydes, and its  $\alpha$ -acetoxyalkyl esters, and their derivatives, A., 720.  
 reaction of, with glycerol, A., 599.  
 decomposition of, by acetic bacteria, A., 545.  
 decarboxylation of, by liver, A., 1287.  
 enzymic fission of compounds of, with amino-acids, A., 777.  
 origin of, in muscle, A., 875.  
 determination of, A., 875.  
 and its lithium salt, A., 252.  
 Pyruvylhydroxamic acid, reaction of, with *o*-toluidine, A., 1025.

## Q.

Quantisation, spatial, appearance of, A., 107.  
 Quantum theory in relation to chemistry, A., 795.  
 Quartz, elasticity and breaking of fibres of, A., 219.  
 piezo-electric determination of breaking strength of fibres of, B., 531.  
 double refraction of, A., 6.  
 effect of fields of force on, A., 799.  
 double refraction and ultra-violet dispersion of, A., 323.  
 electrical conductivity of, in relation to temperature, A., 560.  
 at the transformation point, A., 9.  
 X-ray reflexion from, A., 563.  
 piezo-electric constant of, A., 799.  
 apparatus for fusing of, (P.), B., 423.  
 fused, permeability of, to alcohol, ether, and water, A., 799.  
 manufacture of hollow bodies of, (P.), B., 182.  
 density changes in, A., 329.  
 crystals, modes of vibration of, A., 115.  
 influence of adsorbed films on strength of, A., 565.  
 production of tubes, vessels, etc., of, with a coating of metal, (P.), B., 343.  
 joining of tubes, etc., of, (P.), B., 726, 799.  
 piezoelectric, action of, on sols and suspensions, A., 693.  
 rock, structure of, A., 829.  
*d*- and *l*-Quartz, catalytic fission of racemates by, A., 705.  
 $\beta$ -Quartz, transformation of, into cristobalite, A., 1192.  
 Quartz electrodes. See under Electrodes.  
 Quartz-diorite of Estaca de Vares, Spain, A., 248.  
 Quartzites, effect of firing at 1500° on porosity and specific gravity of, B., 342.

Quebrachine, identity of, with yohimbine, A., 760.  
 Quebrachitol, production of, from rubber latex, B., 615.  
 Quercetin, *O*-methylation of, A., 167, 1256.  
 Quercitol, configuration of, A., 1127.  
 Quinaldine isopropiodide, A., 282.  
 Quinazolines, A., 755.  
 Quince seeds, mucilage from, A., 1177.  
 Quince-seed oil, B., 686.  
 Quinets, composition of, B., 1136.  
 Quinhydrone, crystal structure of, A., 904.  
 electrodes. See under Electrodes.  
 Quinhydrones, A., 1043.  
 theory of, A., 170.  
 Quinic acid, and its derivatives, A., 849, 850.  
 constitution and configuration of, A., 849.  
 action of moulds on, A., 882.  
 Quinidine, rotation of, and its dihydrobromide, A., 760.  
*epi*Quinidine, and its salts, A., 290.  
 Quinine, synthesis of, A., 406.  
 rotation of, and its dihydrobromide, A., 760.  
 in alcoholic solution, A., 952.  
 photochemical action of, with dichromic acid, A., 480.  
 hydrochloride, solubility of, in presence of ethylmethane, A., 991.  
 effect of, on purine metabolism in hyperthyroidism, A., 1284.  
 hydrochloride and sulphate, determination of, in resinous media in capsules, B., 1054.  
 iodobismuthate, changes in, on lixivation with water, B., 622.  
 effect of, on blood of spleen, A., 1163.  
 distribution of, in the organism, A., 191.  
 determination of, volumetrically, A., 406, B., 448.  
 separation of, quantitatively, from pilo carpine, by means of gallotannin, A., 406.  
*epi*Quinine, and its salts, A., 290.  
*trans*-Quinifol, crystal structure of, A., 798.  
 Quinizarins, manufacture of, (P.), B., 13, 833.  
 Quinol, dehydrogenation of, by palladium, A., 156.  
 effect of magnesium hydroxide on oxidation of, A., 578.  
 additive compound of, with cyanogen, A., 1245.  
 ethers, bactericidal properties of, A., 308.  
*o*-phosphate, A., 364.  
 propyl ether, A., 510.  
 Quinols, spermicidal activity of, A., 648.  
 Quinol-*d*-camphorsulphone, and its diacetate, and *dibromo*- and *dichloro*-, A., 947.  
 Quinoline, Raman spectrum of, A., 793.  
 reaction of, with azo- and azoxy-compounds, A., 155.  
 with benzaldehyde, A., 1261.  
 methiodide, 4-iodo-, derivatives of, A., 403.  
 methylenesulphate, A., 251.  
 and its derivatives, compounds formed by action of sulphurous acid and its salts on, A., 402.  
 derivatives, A., 281, 403, 522, 523, 623, 753, 1040, 1261.  
 synthesis of, A., 1039.  
 manufacture of, (P.), B., 623.  
 containing arsenic, A., 1050.  
 pharmacology of, A., 878.  
 production of alkyl or aralkyl derivatives of, (P.), B., 764.

Quinoline, 5:7-diamino-8-*p*-amino-, toluene-sulphonyl derivative, and 8-bromo-5-amino-, A., 1050.  
 5:7-dibromo-8-hydroxy-, as reagent for copper, iron, and titanium, A., 490.  
 8-hydroxy-, dipole moment of, A., 677.  
 influence of substitution on determination of metals with, A., 490.  
 determination of, in urine, A., 640.  
 8- $\alpha$ -hydroxyamino-, propionyl derivative, hydrochloride, A., 1040.  
 6-hydroxy-5-cyano-, and its derivatives, A., 862.  
 6:8-dinitro-3-amino-2-hydroxy-, A., 528.  
*iso*Quinoline derivatives, synthesis of, A., 1262.  
 Quinolines, syntheses with, A., 1144.  
 alkylated, salts of ammono-enolic modifications of, A., 65.  
 Quinolines, hydroxy-, chromability of azo-dyes from, A., 841, 1243.  
 Quinoline-2-aldehyde, preparation of, and its derivatives, A., 402.  
 Quinoline-3-aldehyde, 2:4-dihydroxy-. See Nordictammal.  
 Quinoline-5-aldehyde, 6-hydroxy-, and its salts and derivatives, A., 862.  
 Quinolinesarsinic acids, bromo-, chloro-, and 6-nitro-5-hydroxy-, and their derivatives, A., 1050.  
 Quinoline-4-carboxylic acid, *mono*- and *di*-bromo-, 6-chloro-, and 6-iodo-, A., 754.  
 Quinoline-4-carboxylic acid, 6-nitro-2:3-dihydroxy-, A., 528.  
 3:4-Quinolinequinone, and its derivatives, A., 403.  
 Quinolinesulphonic acid, manufacture of soluble salts of, (P.), B., 251.  
 Quinoline-5-sulphonic acid, 7-iodo-8-hydroxy-, stabilisation of aqueous solutions of, (P.), B., 817.  
 8-amino-, and its salts, A., 402.  
 Quinolinic acid, preparation of, A., 281.  
 condensation of, with *o*-phenylenediamine, A., 864.  
 copper salts, A., 65.  
 Quinolinic anhydride, reaction of, with phenylhydrazine, A., 862.  
 Quinoliumallyl salts, A., 1261.  
 Quinolphenylhydrazide, A., 862.  
 Quinol-2-phenylhydrazine acid, A., 862.  
 Quinolizine, and its picrate, A., 1145.  
 Quinolizinedicarboxylic acid, A., 1145.  
 Quinolizine-1:2:3:4-tetracarboxylic acid, derivatives of, A., 1145.  
 Quinolizinetri-carboxylic acid, esters of, A., 1145.  
 2-Quinolylacetylthiocarbamide, A., 864.  
 $\alpha$ -8-Quinolyl- $\gamma$ -allylthiocarbamide hydrochloride, A., 522.  
 $\beta$ -8-Quinolylamino- $\alpha$ -dimethylaminopropane dihydrochloride, A., 1040.  
 2-(8-Quinolylamino)-4-methyl-4:5-dihydrothiazole hydrochloride, A., 522.  
 N-2'-Quinolylanthranilic acid, A., 66.  
 N-2'-Quinolyl-N-4'-dimethylanthranilic acid, A., 66.  
 Quinolyl-4-hydrazine, A., 403.  
 Quinolylmethylenamines, hydroxy-, and their salts, A., 1261.  
 N-2'-Quinolyl-N-methylanthranilic acid, A., 66.  
 Quinolylpiperidine, 8-nitro-, A., 622.  
 $\beta$ -2-Quinolylpropionhydrazide, A., 167.  
 2-(2'-Quinolylstyryl)quinoline, 6-amino-, and its acetyl derivative, methochloride, A., 403.  
 4-Quinolylurethane, A., 403.  
 Quinolyl-3-urethane, 6:8-dinitro-2-hydroxy-, A., 528.

Quinone. See Benzoquinone.  
 Quinones, crystallography of, A., 682.  
 as enzyme models, A., 90, 427, 578, 880, 1064, 1165, 1286.  
 spermicidal activity of, A., 648.  
 Quinones, hydroxy-, complex salts of, A., 164, 1035.  
 $\alpha$ -Quinones, activation by mercuric chloride of oxidation by, A., 90.  
*p*-Quinoneoxime-imino-compounds, aromatic, manufacture of, (P.), B., 95.  
 Quinotoxine, A., 301.  
 Quinovic acid, A., 945.  
 Quinovose, identity of, with *d*-glucomethyl-ose, A., 146.  
 Quinoxalinoacenaphthazine, and its *mono*- and *di*-nitro-derivatives, A., 67.  
 Quinoxalinoindazine, and its bromo-, 5-bromo-7-nitro-, 5-chloro-, and 5-nitro-derivatives, A., 67.  
 Quinoxalinoanthranazine, amino-, bromo-, hydroxy-, and nitro-derivatives, A., 67.  
 Quinuclidine, oximino-, A., 865.

## R.

Rabbits, composition of, A., 957.  
 on barley and lucerne diets, A., 1161.  
 white Angora, composition of, A., 957.  
 young, phosphatase in, A., 870.  
 Rabbit skins. See under Skins.  
 Racemates, catalytic fission of, by *d*- and *l*-quartz, A., 705.  
 enzymic resolution of, A., 543.  
 Racemic aldehydes. See under Aldehydes.  
 compounds, resolution of, by formation of complex compounds, A., 144.  
 substances, velocity of esterification of, A., 1094.  
 Racemisation, A., 1269.  
 mechanism of, A., 346.  
 Radiation, absorptive power of black and white substances for measurement of, A., 896.  
 interaction of electrons and, A., 209.  
 graphic correlation of, with biological data, A., 880.  
 from electron impact, polarisation of, A., 440.  
 from probe surfaces bombarded by electrons, A., 4.  
 from retardation of protons and rapid electrons, A., 553.  
 black-body, temperature and intensity of, A., 446.  
 differential secondary, in air, for electrons of medium velocity, A., 209.  
 high-frequency, specific ionisation of, A., 5.  
 mitogenetic, A., 201, 775.  
 theory and spectral analysis of, A., 544.  
 chemistry of, A., 966.  
 from white blood-corpuscles, A., 1062.  
 from muscle and from oxidation reactions, A., 966.  
 detection of, with onion roots, A., 1062.  
 See also Rays.  
 Radiation constant, Stefan-Boltzmann, determination of, A., 319.  
 Radicals, classification of, A., 676.  
 acyclic, comparative migratory power of, A., 392, 393.  
 cyclic, migratory power of, A., 391.  
 free, formation of, from organic compounds, A., 1108.  
 electron affinity of, A., 680, 1191.  
 mechanism of reactions of, A., 40.

Radicals, organic, electron-sharing ability of, A., 167, 1259.  
 electronic affinities of, A., 612.  
 determination of relative degree of electronegativity of, A., 409.  
 free, in the gaseous phase, A., 40.  
 Radioactinium,  $\alpha$ -magnetic spectrum of, A., 555.  
 Radioactive atoms, mobility of, on solid surfaces, A., 555.  
 disintegration constants, regularities between, A., 210.  
 elements, chart of structure of, A., 106.  
 effect of structure of, on liberation of emanation, A., 895.  
 adsorption of ions of, by salts, A., 118.  
 separation of, A., 711.  
 emanations,  $\alpha$ -particles from, A., 671.  
 indicators. See under Indicators.  
 minerals, heat effects of, A., 927.  
 specific heat of, A., 39.  
 nuclei, spin of, A., 443.  
 regularities in, A., 5.  
 phenomena of second order, A., 672.  
 preparations, production of, (P.), B., 960.  
 processes, reversibility of, A., 980.  
 substances, nomenclature for  $\beta$ -ray spectra of, A., 318.  
 distribution of, between crystalline and liquid phases, A., 1198.  
 biological effects of, A., 296.  
 transformations, A., 790.  
 Radioactivity, A., 442, 895, 1186.  
 applications of, A., 1186.  
 and geochemistry, A., 359, 1230.  
 effect of, on plant physiology, A., 1181.  
 of the atmosphere, A., 926.  
 Radio-elements. See Radioactive elements.  
 Radiographs, anomalies in, A., 788.  
 Radiothorium,  $\alpha$ -rays from, A., 442, 555.  
 $\gamma$ -ray spectra from derivatives of, A., 556.  
 Radishes, distillation of, A., 60.  
 influence of fertilisers on fixation of carbon dioxide by, B., 953.  
 control of cabbage maggot in, B., 813.  
 Chinese, seeds and oil of, B., 994.  
 Radium, relation between uranium and, A., 5.  
 in Hungarian rocks, A., 1228.  
 in natural waters of U.S.S.R., A., 1227.  
 in petroleum beds, A., 594.  
 content of, in Portuguese minerals, A., 494.  
 rays, coloration of salts by, A., 1007.  
 penetrating, chemical action of, A., 1007.  
 reduction of  $\beta$ -radiation of, (P.), B., 577.  
 secondary  $\beta$ -rays from, A., 318.  
 calorimetry of absorption of  $\gamma$ -rays of, A., 5.  
 emanation. See Radon.  
 Radium barium chloride, inhomogeneity of, A., 583.  
 sulphate, solubility of, in sulphuric acid and sodium sulphate solutions, A., 223.  
 solubility of, in water at 20° C., A., 222.  
 Radium determination:—  
 determination of, in alkaline-earth sulphates, A., 355.  
 in insoluble substances, by emanation method, A., 1223.  
 Radium-B + C, absorption coefficients of  $\gamma$ -rays from, A., 671.  
 Radium-D atoms, recoil, charge on, A., 210.  
 $\beta$ -rays of, A., 443.  
 distribution of, between barium nitrate or chloride and its saturated solution, A., 1198.

- Radium-E**,  $\beta$ -ray spectrum of, A., 210.  
**Radium-F**. See Polonium.  
*Radix althaeae*, assay of, B., 287.  
**Radon** (*radium emanation*), apparatus for purification of, A., 5.  
 $\beta$ -ray spectrum of, A., 443.  
 ionisation by, in spherical vessels, A., 671.  
 ionisation potential of, A., 900.  
 adsorption of, by silica gel, A., 803.  
 action of, on unsaturated hydrocarbons, A., 918.  
**Rags**, carbonisation of, (P.), B., 837.  
**Ragi**, dicarboxylic acid nitrogen of proteins of, A., 204.  
**Ragweed**, proteins of pollen of, A., 889.  
**Rain**, formation of, A., 453.  
 at Mount Vernon, Iowa, A., 926.  
**Rain water**. See under Water.  
**Ramalic acid**, and its derivatives, A., 1252.  
**Raman effect**, A., 212, 559, 675, 898.  
 apparatus for, A., 7, 1225.  
 polarisation of, A., 445.  
 and dipole moment, A., 445.  
 and constitution, A., 109, 675.  
 and the carbon-halogen linking, A., 109.  
 and molecular anisotropy, A., 792.  
 and formation of hydrates in solution, A., 213.  
 in binary solutions, A., 320.  
 in complex molecules, A., 675.  
 with conjugated double linkings, A., 897.  
 in crystals, A., 675, 792.  
 in gases, A., 108, 675.  
 in inorganic compounds, A., 675.  
 in inorganic complex compounds, A., 445.  
 in investigation of intermediate compound formation, A., 983.  
 in liquids, A., 212, 675, 793.  
 due to metal electrons, A., 213.  
 in organic compounds, A., 109.  
 of polyatomic molecules, A., 792.  
 with salt solutions, A., 559, 983, 1075.  
 in unimolecular reactions, A., 320.  
**Ramie**, chemical debarking and degumming of, B., 1116.  
 specific gravity of, B., 177.  
*Rana pipiens*. See under Frogs, winter.  
**Rancidity**, B., 474, 612.  
**Rape**, effect of fertilisers on yield of, B., 567.  
**Rape cake**, decomposition of, in soils, B., 695.  
**Rape oil**, bodying of, B., 313.  
 detection of, in olive oil, B., 648.  
*Raphanus sativus*. See Radish.  
**Raspberries**, control of mites in, B., 571.  
 black, A., 435.  
**Raspberry beetle**. See under Beetles.  
**Raspberry canes**, carbohydrate content of, A., 100.  
 manuring of, B., 201.  
**Raspberry juice**, removal of turbidity from, B., 1134.  
**Rats**, growth and reproduction of, A., 1161.  
 effect of xanthophyll on growth of, A., 200.  
 calcium content of, A., 416.  
 fat in, A., 781.  
 formation of fat and glycogen in, A., 298.  
 nutritional anemia in, A., 79.  
 rickets in, A., 1280.  
 adrenalised fasting, carbohydrate balance for, A., 1292.  
 albino, utilisation of iron of protein foods by, A., 876, 963.  
 white, relation of lime and phosphoric acid to growth and bone development of, A., 876.  
*Rauwolfia caffra*, chemical investigation of, A., 865.  
*Rauwolfia serpentina*, constituents of roots of, A., 203.  
 alkaloids from, A., 664.  
**Rauwolfine**, and its salts, A., 664, 865.  
**Rays**, Becquerel, coloration by, A., 1220.  
 canal, amplification of energy of, A., 1073.  
 transference of positive particles through, A., 789.  
 neutral hydrogen in, A., 554.  
 cathode, diffraction of, by crystals, A., 979.  
 scattering of, at crystal surfaces, A., 788.  
 intensity of interference of, A., 105.  
 excitation of X-ray *L* levels with, A., 788.  
 photographic effects of, A., 29.  
 fast, scattering of, by crystals, A., 552.  
 slow, photographic action of, A., 238.  
 cosmic, A., 5, 556, 979, 1187.  
 spectra of, A., 440, 1187.  
 transition effects in, A., 5.  
 energy of, A., 672.  
 in high atmosphere, A., 1072.  
**Gurwitsch**, in chemical reactions, A., 1098.  
 molecular, monochromatic de Broglie waves from, A., 107.  
 fast, from cathodes of luminous arcs, A., 670.  
 orthoactinic, evaluation and production of, A., 1098.  
 penetrating, A., 895.  
 ionisation of, A., 556.  
 ejection of atoms and light nuclei by, A., 443.  
**Rayleigh**, structure of, A., 445.  
 residual, frequencies of, A., 673.  
**Röntgen**. See X-Rays.  
 slow neutral, formation, detection, and absorption of, A., 789.  
 "ultimate," A., 315.  
 ultra-, destruction of matter by, A., 791.  
 **$\alpha$ -Rays** and atomic research, A., 1186.  
 determination of velocities of, A., 5.  
 range and ionising power of, A., 317.  
 ionisation of, in gases, A., 1074.  
 effect of, on passage of electricity through crystals, A., 671.  
 synthesis and decomposition of ammonia by, A., 1214.  
 **$\beta$ -Rays**, and atomic research, A., 1186.  
 emission of, A., 1186.  
 range and velocity of, for slow electrons, A., 791.  
 energy distribution curves of, A., 1186.  
 diffusion of, by the supporting material, A., 555.  
 scattering of, A., 318.  
 absorption of, A., 895.  
 by molecules, A., 210.  
 spectra of. See under Spectra.  
 magnetic spectrograph for, A., 138.  
 reducing power of, A., 821.  
 **$\gamma$ -Rays**, A., 981.  
 ionisation chambers for local measurement of, A., 210.  
 distinction between neutrons and, A., 1187.  
 in relation to nuclear structure, A., 791.  
 emission of, in disintegration, A., 318.  
 transmission of, by lead, A., 1074.  
 Compton effect in measurement of absorption of, A., 5.  
 scattering correction in measurement of absorption of, A., 1187.  
 absorption of, by projection from light nuclei, A., 318.  
 spectra of. See under Spectra.  
 **$\gamma$ -Rays**, photo-electric effect of *L*-electrons for, A., 895.  
 effect of, on adsorption, A., 1084.  
 ionisation of air by, A., 895.  
 interaction of, with atomic nuclei, A., 791.  
 use of, in testing metals, A., 1215.  
 hard, absorption and scattering of, A., 1074.  
 absorption of, by heavy elements, A., 318.  
 monochromatic, absorption of, A., 318.  
 nuclear, artificial production of, A., 671.  
 selection rule for, A., 672.  
 penetrating, emission of high-velocity protons by action of, on substances containing hydrogen, A., 210.  
 short-wave, scattering of, A., 671.  
**H-Rays**, range and ionising power of, A., 317.  
 expansion chamber for, A., 554.  
 measurements on, A., 211.  
 from paraffin films, by  $\alpha$ -ray bombardment, A., 1186.  
 artificial, ionising power of, A., 1186.  
**X-Rays**, emission of, independent of temporary excitation, A., 3.  
 apparatus for production of, (P.), B., 232, 804.  
 mountings for, (P.), B., 115.  
 for crystal analysis, etc., A., 245.  
 installations for, (P.), B., 192.  
 tubes, A., 1225; (P.), B., 114, 353.  
 steel, A., 1225.  
 wavelengths of, A., 105.  
 measurement of, with an electron counter, A., 553.  
 fluorescent screen for, (P.), B., 734.  
 photo-electric photometer for comparison of intensities of, A., 245.  
 reflexion of, A., 3.  
 by crystals, A., 325, 902.  
 reflexion and absorption of, A., 553.  
 refractive index of liquids for, A., 669.  
 diffraction of, by liquids, A., 12, 986.  
 by liquid metals, A., 1192.  
 by molecules with two carbon atoms, A., 987.  
 spectra of. See under Spectra.  
 dispersion of, in quartz, A., 208.  
 atom factors for, in region of anomalous dispersion, A., 552.  
 scattering of, by chlorine, A., 892.  
 by crystals and gases, A., 892.  
 by gases, A., 316.  
 by monoatomic gases, A., 113, 788.  
 by diatomic gases, A., 1072.  
 by polyatomic gases, A., 441.  
 by metals, A., 11.  
 by paraffin, aluminium, copper, and lead, A., 11.  
 by sodium fluoride, A., 979.  
 by solids, A., 1072.  
 by water, A., 11.  
 effect of secondary structure on interference of, A., 1072.  
 absorption coefficients of, A., 892.  
 absorption of, in gases, A., 316.  
 in molecular gases, A., 892.  
 by glass, B., 1079.  
 action of, A., 542.  
 effect of, on adsorption, A., 1084.  
 electron emission of metals due to, A., 1184.  
 photo-electric effect of, in light elements, A., 788.  
 photographic effects of, A., 29.  
 biological effect of, A., 542.  
 action of, on living tissues, A., 1164.



**X-Rays** in chemistry and industry, B., 323.  
 atomic analysis by, A., 586.  
 determination of structure by, A., 927.  
 investigation of structure of technical materials by, A., 450.  
 ionisation determination with, A., 113.  
 powder analysis with, A., 11.  
 asterisms in crystal diagrams produced by, A., 1078.  
 apparatus for treatment of packaged tobacco, food, etc., with, (P.), B., 686.  
 quantitative analysis with, A., 356.  
 monochromatic, excitation of, A., 892.  
 soft, absorption of, in gases, A., 113.  
**Rayon.** See under Silk, artificial.  
**Reactions**, theory of, A., 582.  
 radiation hypothesis and photochemical threshold of, A., 479.  
 mechanism of, A., 716, 944.  
 regions of, A., 917.  
 initiation of, with evolution of light in closed vessels, (P.), B., 454.  
 promotion of, (P.), B., 820.  
 apparatus for carrying-out of, (P.), B., 243.  
 carrying-out of, under pressure (P.), B., 86.  
   at high temperatures, (P.), B., 372.  
 inhibition of, A., 1085.  
 inhibitory effects of substituents in, A., 154.  
 affinity of, A., 814.  
 use of molecular evaporation in, A., 601.  
 action of solvents in, A., 22.  
 involving collisions between solute and solvent molecules, A., 233.  
 of liquids at high temperatures and pressures, apparatus for, A., 925.  
 between solids at high temperatures, A., 128.  
 anaërobic, source of heat in, A., 778.  
 chain, theory of, A., 1209.  
   surface adsorption in, A., 344.  
   effect of inert gases on, A., 1209.  
   detection of, A., 818.  
 electrolytic. See Electrolytic reactions.  
 endothermic, carrying-out of, in periodically heated chambers, (P.), B., 660.  
 enzymic and organic, mechanism of, A., 352.  
 exothermic, carrying-out of, (P.), B., 820.  
   apparatus for, (P.), B., 131.  
   control of, (P.), B., 964.  
   at high temperatures, B., 100.  
 heterogeneous, kinetics of, A., 1211.  
 ionic, neutral salt effect in, A., 818.  
 irreversible, reciprocal relations in, A., 339.  
 organic, ionic theory of, A., 11.  
   equilibria in, A., 576.  
 photochemical. See Photochemical reactions.  
 polar and non-polar, A., 581.  
 precipitation, A., 1059.  
 unimolecular, A., 473.  
   energy exchange in, A., 576.  
   effect of foreign gases on, A., 815.  
   influence of solvent in, A., 1209.  
 uni- and bi-molecular, velocity coefficients of, A., 232.  
**Reagents**, analytical, specifications for, A., 920.  
**Records**, phonograph, manufacture of, (P.), B., 1042.  
   sound. See Sound records.  
**Rectifiers.** See under Electric and Electrolytic.  
**Red lead**, reactions of linseed oil and, B., 900.  
   comparison of iron oxide and, as rust preventives, B., 561.

**Red lead**, dispersed, B., 436.  
   ground, thickening of, in linseed oil, B., 901.  
   analysis of, B., 474.  
   determination in, of iron, B., 195.  
 "Red oil," action of negative catalysts with, B., 30.  
**Reducing substances**, determination of, A., 487.  
**Reductase**, detection of, B., 784.  
**Reduction**, electronic theory of, A., 11.  
   biological, A., 1062.  
   determination of, with the molybdenum-blue reaction, A., 314.  
**Redwood bark**, production and treatment of wall boards from, (P.), B., 720.  
**Reflectivity**, far infra-red, A., 107.  
**Refraction**, atomic, and constitution, A., 325.  
   double, A., 900.  
   due to flow, A., 571.  
   equivalent, of dissolved electrolytes, A., 804.  
**Refractive index**, determination of, A., 137, 713, 1105.  
   dependence of, on density changes, A., 324.  
   of acetylenic compounds, A., 447.  
   of liquids for X-rays, A., 669.  
   of mixed liquids, A., 222.  
   of mixed immersion liquids, A., 561.  
   of materials such as muscovite mica, determination of, A., 247.  
   of mounting media, A., 1225.  
**Refractivity**, temperature coefficients of, for liquids, A., 1105.  
**Refractometers**, (P.), B., 133.  
   Abbé, blanket calibration chart for, A., 1105.  
   interference, A., 827.  
**Refractometry**, constant-temperature water supply for, A., 1225.  
**Refractories**, B., 262.  
   production of, (P.), B., 105.  
   slagging of, B., 105.  
   infra-red radiation of, A., 320.  
   determination of water absorption of, B., 771.  
   corrosion of, B., 726.  
   use of, in metallurgical operations, B., 229.  
   for furnaces, (P.), B., 888.  
   in boiler furnaces, B., 306.  
   for use at high temperatures, B., 384, 755.  
   aluminosilicate, B., 229.  
   chrome, manufacture of, (P.), B., 1032.  
   dense, (P.), B., 263.  
   dry-press, properties of, B., 24.  
   fireclay, effects of rate of firing and cooling on physical properties of, B., 1080.  
   heat-conducting, for use at high temperatures, (P.), B., 344.  
   magnesite, effect of iron oxide on, B., 384.  
   resistant to fused slag and glass, manufacture of, (P.), B., 467.  
   resistant to fused sodium sulphate, B., 726.  
   silica-alumina, manufacture of, (P.), B., 772.  
   sillimanite, for kilns, B., 182.  
   zirconium, manufacture of, (P.), B., 507.  
**Refractory articles**, (P.), B., 549.  
   manufacture of, from alumina, (P.), B., 679.  
   from zircon, (P.), B., 106.  
   mould for, (P.), B., 984.  
   glazing of, (P.), B., 726.  
   blocks, manufacture of, (P.), B., 601.  
   bodies, production of, from vitreous silica, (P.), B., 343.

**Refractory bricks.** See under Bricks.  
**cements.** See under Cement.  
 materials, (P.), B., 343.  
   manufacture of, (P.), B., 106, 423, 424.  
   bonding of, B., 229.  
   casting of, (P.), B., 679.  
   mould for, (P.), B., 549.  
 kilns for heat-treatment of, (P.), B., 800.  
   behaviour of, in continuous vertical retorts, B., 1080.  
   ceramics of, A., 997.  
   permeability of, to gases, B., 64.  
   comparative rates of flow of water and air through, B., 64.  
   action of carbon monoxide on, B., 64.  
   for electric furnaces, B., 24.  
   determination of silica and alumina in, B., 147.  
 metals. See under Metals.  
 oxides. See under Oxides.  
 products, manufacture of, (P.), B., 726.  
   for furnace linings, etc., (P.), B., 936, 937.  
**Refrigerants**, (P.), B., 84, 212, 405, 452, 708, 1012.  
   stabilisation of, (P.), B., 324.  
   thermo-physical properties of, B., 211.  
   latent heat of, A., 453.  
   liquid carbon dioxide as, B., 659.  
   solid carbon dioxide as, B., 659.  
   dichlorodifluoromethane as, A., 115; B., 659.  
   dichloromethane and dichloroethylene as, B., 659.  
   methyl chloride as, B., 659.  
   methylamine as, B., 1011.  
   sulphur dioxide as, B., 659.  
   gaseous, specific volumes of, A., 447.  
   non-inflammable, (P.), B., 1012.  
**Refrigeration**, (P.), B., 84.  
   merging of stages in, B., 291.  
   applications of, in chemical industry, B., 659.  
   with solid carbon dioxide, (P.), B., 374.  
**Refrigeration apparatus**, (P.), B., 165, 757.  
   stabilisation of atmospheres in, (P.), B., 324.  
   use of water containing calcium sulphate in, A., 990.  
   absorption, (P.), B., 131, 917.  
   prevention of corrosion in, (P.), B., 821.  
**Refrigeration machines**, (P.), B., 630.  
   absorption, (P.), B., 630.  
**Refrigeration plant**, B., 627.  
**Refrigeration systems**, condensers for, (P.), B., 51.  
   liquid for, (P.), B., 964.  
   separation of oil in, (P.), B., 821.  
   testing for leaks in, (P.), B., 2.  
   absorption, (P.), B., 1012.  
**Refrigerators**, lubrication and sealing of compressors for, (P.), B., 452.  
   multi-stage compressors for, B., 323.  
   evaporators for, (P.), B., 84.  
   heat-insulating fillers for, (P.), B., 821.  
   use of ammoniates in, B., 840.  
   non-corroding brine for, (P.), B., 1028.  
   detection of leaks of methyl chloride from, B., 51.  
   absorption, (P.), B., 1013.  
**Refuse**, mechanical separation or grading of, (P.), B., 294.  
   incineration of, (P.), B., 1010.  
   utilisation of, (P.), B., 754.  
   fish and slaughterhouse, drying of, (P.), B., 286.  
*Rehmannia lutea*, blood-sugar lowering by, A., 541.  
**Reimer-Tiemann reaction**, A., 946.

Reinecke's acid, use of, in detection and determination of organic bases, A., 1118.  
 Relaxin, A., 308.  
 Rennin, A., 881.  
 Reproduction, effect of acid ingestion on, A., 190.  
 Reptiles, embryological chemistry of, A., 876.  
 Reptile skins, tanning of, (P.), B., 1094.  
 Resins, fractional distillation of, (P.), B., 778.  
   of the phenolphthalein series, B., 272.  
   acrolite, B., 356.  
   aldehyde-urea, manufacture of, (P.), B., 688.  
   artificial, (P.), B., 437.  
     manufacture of, (P.), B., 32, 235, 272, 315, 563\*, 688, 808, 948, 998, 1042.  
       from diphenyl, (P.), B., 998.  
       from unsaturated resins, (P.), B., 72.  
     compression of, (P.), B., 808.  
     cutting of, (P.), B., 154.  
     as ground-joint lubricants in distillation of hydrocarbons, A., 1227.  
     manufacture of articles from, (P.), B., 688, 808, 902.  
     production of moulded articles from, (P.), B., 614.  
     manufacture of electrical insulators from, (P.), B., 734.  
     "Alkali," B., 562.  
   dammar Malayan and sandalwood, B., 196.  
   elemi Manila, elemic acid from, A., 397.  
   acid, A., 749.  
   furfuraldehyde-urea, manufacture of, (P.), B., 737.  
   glyceride, production of, (P.), B., 1042.  
   glycerol phthalate, in quick-drying house paints, B., 194.  
   of the glyptal type, B., 1040.  
   guaiacum, constituents of, A., 735.  
   hydrophobe, production of, from carbamide and aldehydes, (P.), B., 807.  
   natural, B., 196.  
   "coalification" of, B., 245.  
   effect of silent electric discharge on, B., 850.  
   compositions of rubber with, (P.), B., 650.  
   testing of, B., 778.  
   oil-soluble, production of, (P.), B., 808.  
   phenol, production of, (P.), B., 437.  
   phenol-acetaldehyde, B., 806.  
   phenol-aldehyde, preparation of solutions of, (P.), B., 475.  
   phenol-furfuraldehyde, (P.), B., 32.  
   synthetic, (P.), B., 687.  
     constitution of, A., 150.  
     manufacture of, B., 947; (P.), B., 32, 118, 119, 235, 272, 357, 475, 518, 519, 688, 737, 902, 948, 1091, 1092.  
     plant for, B., 154.  
     alcohol-amines and organic acids, (P.), B., 998.  
     from aldehydes and aryl sulphonamides, (P.), B., 998.  
     from ammonium thiocyanate and guanidine, B., 436.  
     from petroleum hydrocarbons, B., 1126.  
     recovery of volatile solvents from, B., 196.  
   working up of, B., 562.  
   gelation of, B., 71.  
   drying rates of, with drying oils, B., 901.  
   use of, in paints and varnishes, B., 851.  
   in rubber, B., 32.  
   production of articles from, (P.), B., 357, 737.

Resins, synthetic, coating compositions from, B., 562; (P.), B., 235.  
   coating, lining, or cementing compositions from, (P.), B., 902.  
   production of laminated materials from, (P.), B., 1042.  
   production of moulded articles from, (P.), B., 779.  
   manufacture of watch-glasses from, (P.), B., 688.  
   of low acidity, production of, (P.), B., 1042.  
   Albertol, B., 1126.  
   flexible, (P.), B., 357.  
   water-soluble, and dispersions thereof, (P.), B., 272.  
   vinyl ester, production of, (P.), B., 437.  
   wood, removal of colours from, (P.), B., 807.  
   vacuum distillation of, (P.), B., 1091.  
   modified Storch-Morawski test for, B., 997.  
 Resin acids, A., 1241.  
   esters, manufacture of, (P.), B., 688, 1042.  
   determination of, in olive-kernel oils, B., 70.  
 Resinous compositions, manufacture of, (P.), B., 272.  
   moulded articles from, (P.), B., 272.  
   oil-proof, (P.), B., 437.  
 Resinous materials, production of, (P.), B., 475.  
   containing fillers, (P.), B., 519.  
 Resinous products, manufacture of, (P.), B., 614.  
   coating of, with metals, (P.), B., 948.  
 Resorcinol *o*-phosphate, A., 364.  
   additive compound of, with cyanogen, A., 1245.  
   derivatives, substitution in, A., 380.  
   methyl acetyl ether, tribromo-, A., 510.  
   3-methyl ether, bromo-derivative, A., 380.  
   isopropyl ether, and its nitrosation, A., 509.  
   analysis of, A., 292.  
   detection of, by Carobbio's reaction, A., 632.  
 Resorcinol, 4-amino-, and its derivatives, A., 1245.  
   dinistro-, determination of cobalt by, A., 1224.  
   nitroso-, derivatives of, A., 53.  
 Resorcinolazo- $\beta$ -naphthol, A., 1245.  
 Resorcinolazoresorcinol, A., 1245.  
 Resorcinoldisazobenzene, ethers of, A., 1245.  
 Resorcinolpyrazinedicarboxylein. See 12:15-Diazo fluorescein.  
 Resorcyalcohols, A., 380.  
 Resorcyaldehyde, condensation product of, with dibenzyl ketone, and its derivatives, A., 273.  
 Resorcyclidenebisdi-indone, and its anhydro-derivative, A., 1252.  
 Resorption, physical chemistry of, A., 85.  
 Respiration, determination of, manometrically, in mammals, A., 763.  
   of persons under varying conditions, action of ephedrine and morphine on, A., 540.  
   of tissues, A., 537.  
   effect of methylglyoxal on, A., 1281.  
   effect of salts of organic acids on, A., 1281.  
   optimum  $p_H$  for, A., 1281.  
 Respirators, (P.), B., 322.  
   impregnation of smoke filters for, (P.), B., 486.  
   absorbent for ammonia and hydrogen sulphide for, (P.), B., 210.

Respiratory appliances, (P.), B., 962.  
   filters for, (P.), B., 818.  
   for supply of purified air, (P.), B., 290.  
   oxygen, (P.), B., 754.  
   generating cartridges for, (P.), B., 754.  
   generating material for, (P.), B., 63.  
 Respiratory metabolism in children, A., 1068, 1293.  
   of exercise in depancreatized dogs, A., 1058.  
 Respirometer, A., 1150.  
 Respirometry, A., 1150.  
 Retene, A., 1029.  
   preparation of, from rosin oil, B., 331.  
   synthesis of, A., 839.  
 Retene, hydroxy-derivatives of, A., 164.  
 $\alpha$ -Retenecarboxylic acid, and its anilide, A., 1029.  
 Retenecquinones, hydroxy-, and their derivatives, A., 165.  
 $\alpha$ -Retenecquinonecarboxylic acid, derivatives of, A., 1029.  
 Retenecquinonesulphonic acids, ethyl esters, A., 943.  
 Retene-6-sulphonic acid, *p*-toluidine salt, A., 165.  
 Retenesulphonic acids, derivatives of, A., 943.  
 9-Retenol, and its derivatives, A., 165.  
 Retina, effect of amino-acids on respiration of, A., 420.  
 Retorts, (P.), B., 451.  
   heating of settings of, (P.), B., 667.  
   suction control apparatus for, (P.), B., 250.  
   repairing of, (P.), B., 407.  
   air-cooled, (P.), B., 579.  
   carbonisation, (P.), B., 376, 667, 1017.  
   gas, steaming of, B., 631.  
   control of pressure in, B., 296.  
   exhaustion and governing of gas from, B., 296.  
   vertical, coke extractors for, (P.), B., 378.  
   vertical, (P.), B., 632.  
   carbonisation of coal in, B., 632.  
   for smelting ores, etc., (P.), B., 867.  
   continuous, B., 906.  
   steaming in, B., 375.  
   internally-heated, (P.), B., 632.  
 Retroneic acid, and its derivatives, A., 286.  
 Retronecine, and its benzoyl derivative, and their salts, A., 286.  
 Retrorsine, and its methiodide, A., 286.  
 Rhamnitol triphenyl methyl ethers, A., 42.  
*l*- $\alpha$ -Rhamnohexitol triphenyl methyl ether, A., 42.  
 Rhamnose phenylhydrazones and nitrophenylhydrazones, and their optical rotation, A., 146.  
*Rhamnus purshiana*, fluid extract of, B., 863.  
   bark and its extracts, physiological activity of, in relation to content of anthraquinone derivatives, B., 816.  
 Rhenium, discovery and properties of, A., 247.  
   nuclear moment of, A., 210.  
   geochemistry of, A., 1228.  
   physical chemistry of, A., 469.  
   electric furnace spectrum of, A., 891.  
   electrochemistry of, A., 236.  
   magnetic resolution and nuclear moment of, A., 562.  
   catalytic properties of, A., 1095.  
   chemistry of, A., 824.  
   production of filaments of, (P.), B., 684.  
   coating of refractory metals with, (P.), B., 267.

- Rhenium compounds, tervalent, oxidation of, A., 133.
- Rhenium halides, complex, A., 711.
- dioxide, thermite reaction with, A., 585.
- trioxide, A., 1008.
- crystal structure of, A., 903.
- trioxide and oxychlorides, A., 708.
- pentoxide, A., 32, 353.
- heptoxide, A., 585.
- heptoxide and octoxide, vapour pressure of, A., 1081.
- oxides, heats of formation of, A., 575.
- lower, A., 1101.
- oxychloride, A., 585.
- heptasulphide, A., 239.
- Rhenium detection and determination:—  
analytical chemistry of, A., 1224.  
and its alloys, spectrographic analysis of, B., 266.
- detection and determination of, microchemically, A., 1224.
- Rheology, A., 18.
- Rheumatism, calcium and potassium balance in, A., 419.
- uric acid in duodenal bile after mud treatment for, A., 1159.
- Rhizobia, growth of, on nitrogenous media, A., 1066.
- nitrogen fixation by, A., 883.
- isoRhizonaldehyde, acetyl derivative, A., 851.
- isoRhizonic acid, synthesis of, and its acetyl derivative, A., 851.
- isoRhodose. See *d*-Glucomethylose.
- Rhodin *g*, and its derivatives, A., 1264, 1266.
- Rhodins, methyl esters of, and their derivatives, A., 174.
- Rhodinol, Raman spectrum of, and its isomerism with citronellol, A., 897.
- Rhodinoporphyrins *g*, and their derivatives, A., 1264, 1265.
- Rhodium, electrodeposition of, B., 645.
- atomic heat and coefficient of expansion of, A., 220.
- specific heat of, A., 220.
- Rhodium alloys with palladium, electro-deposition of, (P.), B., 610.
- Rhodium bases:—  
Bromopentamminorhodium bromide, thermal decomposition of, A., 240.
- Rhodium dioxide, A., 32.
- Rhodium organic compounds:—  
Rhodium triethylenediamine, configuration of, A., 239.
- Rhodium determination and separation:—  
determination of, and its separation from iridium, A., 1224.  
and its separation from platinum, etc., A., 356.
- Rhodnius *pulvix*, excretion in, A., 640.
- Rhodolite, from N. Carolina, A., 1228.
- Rhooe, permeability of, to acetic acid and ammonia, A., 204.
- Rhubarb, effect of age and season on composition of, A., 1295.
- Rhus *succedanea* and *vernifera*, Russian, fatty oils from, B., 30.
- Ribs, rat's, ossification in, A., 1173.
- Ribosephosphoric acid, formation of, from xanthylic acid, A., 497, 1236.
- Rice, chemical composition of, in relation to soils of China and Japan, B., 395.
- effect of fertilisers on yield of, B., 567.
- effect of ammonifying, nitrifying, and denitrifying powers of soils on yield of, B., 441.
- storage of, B., 445.
- lecithins of, in relation to beriberi, A., 417.
- Rice, feeding-stuffs from, B., 574.
- domestic, cooking quality of, B., 748.
- determination of starch in, B., 127.
- Rice bran, properties of antineuritic vitamin of, A., 433.
- Rice grains, poor quality, B., 445.
- Rice oil, Philippine, composition of, B., 560, 805.
- Ricinic acid, sodium salt and derivatives of, and chloro-, hydroxy-, and thiol-, A., 526.
- Ricinine, chloro-, and hydroxy-, A., 526.
- Ricinineacetic acid, thiol-, and its derivatives, A., 526.
- Ricinoleic acid, and its salts and esters, B., 648.
- pure, physical properties of, A., 988.
- mercuric salt, (P.), B., 495.
- sodium salt, purification of, A., 43.
- d*-Ricinoleic acid, and its *l*-ephedrine and *l*- $\alpha$ -phenylethylamine salts, A., 366.
- Rickets, A., 537, 873.
- special foods for prevention of, A., 973.
- treatment of, with phosphorus compounds, A., 642.
- without irradiated ergosterol, A., 537.
- low serum-phosphorus for healing of, A., 187.
- iodine in cod-liver oil in relation to, A., 1280.
- activity of irradiated milk in, A., 973.
- action of blood-serum on bone in, A., 1057.
- iron content of organs in, A., 187.
- phosphatase of cartilage in, A., 1280.
- phosphorus partition in blood in, A., 1057.
- antifixative action of strontium carbonate in, A., 539.
- in chicks, relation of calcium and phosphorus of blood-serum to, A., 769.
- in monkeys, A., 783.
- in rats, A., 537, 1280.
- phosphorus balance in, A., 769.
- experimental, A., 1159.
- hypotrophic, A., 642.
- "incurable," origin of, A., 769.
- late, A., 769.
- calcium and phosphorus metabolism in, A., 642.
- Rillensteine, A., 248.
- Rings, formation of, and polymerisation, A., 366, 601, 1233.
- space displacements of terminal carbon atoms in, A., 680.
- theory of contraction of, and related rearrangements, A., 1029.
- Rinmann's green, cobaltic modification of, A., 585.
- Rissic acid, synthesis of, A., 751.
- dimethyl ester, A., 619.
- Rivanol, colloid chemistry of, A., 808.
- River water. See under Water.
- Rivularia *polyotis*, gas content of cenobia of, A., 888.
- Roads, construction of, (P.), B., 508.
- materials for, (P.), B., 26, 107\*, 184, 728, 800, 889, 938.
- treatment of, (P.), B., 345.
- production of binding agents for, (P.), B., 800.
- bituminous materials for, (P.), B., 26, 107, 345.
- chemistry of bituminous materials for, B., 468.
- cold-flowing bituminous materials for, (P.), B., 264, 728.
- uniting of rubber tiles to bituminous layers for, (P.), B., 35.
- compositions for, (P.), B., 425.
- Roads, drying of materials for, (P.), B., 243.
- surfaces of, compositions for, (P.), B., 1033.
- production of agglomerates for, (P.), B., 184.
- bituminous emulsions for, (P.), B., 985.
- use of coal tar for, B., 134.
- hygroscopic material for, (P.), B., 602.
- treatment of, to prevent slipperiness, (P.), B., 107.
- paving materials for, (P.), B., 985.
- dressing for, (P.), B., 550.
- use of tar for, B., 727.
- macadam, construction of, (P.), B., 468.
- tarred macadam, construction of, (P.), B., 264.
- Roasting, oxidative, sulphatising, and chlorinating, B., 469.
- Roasting apparatus, (P.), B., 942.
- Robinia *pseudoacacia*, colouring matter from, A., 280.
- Robinin, A., 280.
- Rochelle salt, characteristic temperature for, A., 983.
- racemisation of, A., 1210.
- Rocks, classification of, A., 493.
- origin of circulating sulphate solutions in, A., 926.
- diagrams of weathering of, A., 596.
- examination of, in Wood's light, A., 248.
- protective coating for specimens of, A., 38.
- from the Austrian Alps, A., 1107.
- of the Black Hills region, N.E. Wyoming, A., 248.
- of Buckskin Gulch, Colorado, A., 926.
- of the Roundstone district, County Galway, A., 1107.
- calcareous bituminous, production of mineral oil from, B., 169.
- carbonate, analysis of, B., 1094.
- Carpathian, A., 1228.
- granitic, in India, A., 1107.
- Hungarian, radium in, A., 1228.
- igneous, of northern Bohemia, A., 494.
- plutonic, of Hungary, A., 1229.
- sedimentary, vanadium content of, A., 926.
- volcanic, from Uganda, A., 1015.
- "zebra," A., 38.
- sampling of, for analysis, A., 1220.
- determination in, of vanadium, A., 591.
- of zirconium, A., 356.
- Rock-glass, anorthoclase-bearing, A., 1015.
- Rock-salt, plasticity of, A., 1080.
- plasticity and tempering of crystals of, A., 683.
- plastic properties of, deposited under water, A., 987.
- strength of wetted crystals of, A., 452.
- influence of foreign particles on cohesion in crystals of, A., 565.
- optical properties of, A., 898.
- intensity of light scattered by, A., 213.
- fluorescence of, A., 793.
- electrical conductivity of, A., 1190.
- in relation to field strength, A., 447.
- ionic migration in, A., 213.
- photo-electric association of sodium in, A., 321.
- cleavage of, A., 452.
- blue, A., 898.
- coloured, photochemistry of, A., 321.
- X-rayed, photo-electric conductivity of, A., 560.
- synthetic, cohesion limits and ultra-microscopic sol formation of, A., 219.
- See also Sodium chloride.

- Rodonine, A., 1038.  
 Roebingite, A., 1107.  
 Romeite, crystal structure of, A., 450.  
 Roofs, materials for, (P.), B., 602.  
   water-tight cement slabs for, (P.), B., 230.  
   coloured granules for coating materials for, (P.), B., 679.  
   bitumen-impregnated fabrics for, (P.), B., 1076.  
   shingle surfacing for, (P.), B., 842.  
   tiles for, (P.), B., 642.  
   grooved tiles for, (P.), B., 308.  
 Rooms, changes in air of, during occupation, B., 914.  
 Roots, effect of nutrition of seeds on development of, A., 1295.  
 Root-rot, effect of salt concentration and soil reaction on, B., 907.  
   sulphur barriers and graminaceous crop barriers for control of, B., 908.  
 Ropes, coating of, with plastic masses, (P.), B., 806.  
 Roses, chlorosis of, B., 362.  
 Rose oil, Bulgarian, B., 368.  
 Rosin. See Colophony.  
 Rosin oil, in rubber and reclaimed rubber, B., 119.  
   dielectric constant and power factor of, A., 447.  
   production of electrical insulating material from, (P.), B., 235.  
   aldehyde, from Philippine pine trees, B., 736.  
   detection of, in colophony, B., 647.  
 Rotation, and structure, A., 1028.  
   and chemical constitution, A., 276, 857, 1249.  
   influence of solvents and temperature on, A., 679.  
   of liquids, A., 678.  
   of optically-active compounds, influence of solvents on, A., 794.  
   of vapours, A., 323.  
   magnetic, of mixed liquids, A., 794.  
   molecular, of rarefied gases, A., 668.  
   of solids, A., 986.  
 Rotenone, A., 165, 382, 400, 401, 739, 860, 950, 1039.  
   structure of, A., 751.  
   constitution of, A., 619, 860.  
   and its derivatives, synthesis of, A., 751.  
   as an insecticide, B., 202.  
   comparative efficiency of pyrethrins and, as contact insecticides, B., 1130.  
*n*- and *iso*-Rotenones, acetyl derivatives of, A., 950.  
 Rotenonone, structure of, A., 1039.  
 $\beta$ -Rotenonone, A., 860.  
 Rouge, manufacture of, (P.), B., 901.  
 Rowland grating, use of, A., 668.  
 Rubans, A., 865.  
 Rubanols, stereoisomeric, and their salts, A., 865.  
 9-Rubanone dibenzoyl-*d*-tartrate, A., 865.  
 Rnbatoxanone dibenzoyl-*d*-tartrate, A., 865.  
 Rubber, X-ray study of structure of, B., 273.  
   in Philippine plants, B., 563.  
   manufacture of, (P.), B., 120, 358, 520.  
   from latex, (P.), B., 520.  
   effects of mixed solvents on extraction of, B., 476.  
   reclaiming of, (P.), B., 34, 1044.  
   from rubberised fibrous materials, (P.), B., 999.  
   from admixture with cellulose, (P.), B., 951.  
 Rubber, compounding of, (P.), B., 520, 950, 999, 1044.  
   for vulcanisation, (P.), B., 520.  
   compounding of aluminium powder with, B., 1092.  
   incorporation of cellulose derivatives with, (P.), B., 651.  
   chlorination of, (P.), B., 951, 1044.  
   vulcanisation of, B., 33, 650; (P.), B., 34, 72, 157, 198, 237, 273, 358, 393, 438, 615, 689, 739.  
   composition for, (P.), B., 157.  
   compositions for retarding, (P.), B., 1044.  
   accelerators for, (P.), B., 34, 72, 198, 358, 438, 476, 494, 520, 615, 616, 651, 689, 739, 779, 809, 852, 904, 928, 974, 999, 1020, 1044, 1093, 1094, 1114.  
   "Barak" activator for, B., 33.  
   influence of white facies on, B., 156.  
   adsorption of, by carbon black, B., 631.  
   effect of cadmium compounds on organic accelerators during, B., 650.  
   apparatus for, (P.), B., 164.  
   steam pressure for, B., 949.  
   kinetics of, B., 119.  
   temperature coefficient of, B., 358.  
   thermochemistry of, B., 519.  
   reactions occurring in, B., 316, 651.  
   effect of carbohydrates on, B., 615.  
   role of proteins in, B., 33.  
   in hot air, B., 615.  
   with benzoyl peroxide, B., 119.  
   by sulphur chloride, B., 1092.  
   accelerated with tetramethylthiuram monosulphide, influence of zinc and lead on rate of, B., 316.  
   effect of ferric sulphate on vulcanisation and ageing of, B., 475.  
   purification and properties of, B., 852.  
   electrodeposition of, from latex, B., 154.  
   from aqueous dispersions, (P.), B., 437.  
   catalytic heat treatment of, (P.), B., 237.  
   mastication of, B., 155, 358.  
   treatment of, to facilitate mastication, (P.), B., 437.  
   reinforcement of, B., 155.  
   hysteresis and reinforcement of, B., 155.  
   elasticity of, B., 852.  
   elastic constants of, at great stresses, B., 808.  
   measurement of plasticity of, B., 197.  
   treatment of, to render it more plastic, (P.), B., 120.  
   machines for plastication of, (P.), B., 120.  
   tests on, with parallel-plate plastimeter, B., 236.  
   compression stress-strain curve of, B., 808.  
   resistance of, to flexing, B., 316.  
   improvement of resistance to abrasion and flexing of, (P.), B., 1000.  
   improvement of wear-resistance of, (P.), B., 1000.  
   effect of ageing on taut diaphragms of, B., 563.  
   tensile testing of, B., 236.  
   influence of rate of stretching in, B., 236.  
   ring test-piece for Schopper tensile machine for, B., 131.  
   tensile and elongation tests on, (P.), B., 213.  
   effect of repeated stresses on, B., 316.  
   refractometry of, B., 949.  
   heat of combustion of, A., 342.  
   specific gravity of, before and after vulcanisation, B., 949.  
 Rubber, absorption by, of water, B., 1043, 1092.  
   and its relation to the protein content, B., 155.  
   condition of, in solutions on the basis of their surface characteristics, B., 120.  
   absorption of nitrogen by benzene solutions of, in sunlight, A., 222.  
   solubility of organic compounds in, B., 651.  
   solutions, B., 563, 738.  
   manufacture of, (P.), B., 120.  
   change in viscosity of, on stirring, B., 809.  
   surface tension of, B., 155.  
   degradation of, B., 155.  
   influence of oxygen on, B., 1093.  
   dispersions, compounding of, (P.), B., 33.  
   production of threads from, (P.), B., 359.  
   aqueous, manufacture of, (P.), B., 33, 120, 520, 1043.  
   electrodeposition of rubber from, (P.), B., 437.  
   sols, solvation of, A., 1203.  
   distillates, polymerisation of, (P.), B., 237.  
   depolymerisation of, (P.), B., 358.  
   oxidation of, B., 315.  
   catalytic action in autoxidation of, B., 738.  
   use of abrasives in, B., 519.  
   determination of manganese in fillers for, B., 119.  
   properties of titanium fillers for, B., 949.  
   use of impure iron oxide in, B., 475.  
   use of synthetic resins in, B., 32.  
   scorch retarders for use with, B., 315.  
   effect of selenium in, B., 197.  
   production of precipitated silica for admixture with, (P.), B., 506.  
   action of tetralin on, B., 519.  
   whiting for use in, B., 1043, 1127.  
   cementing of, to metal, (P.), B., 999.  
   colouring of, (P.), B., 1093.  
   colours for, (P.), B., 520.  
   printing on, (P.), B., 156.  
   coating with, of concrete, (P.), B., 425.  
   of fibrous materials, (P.), B., 999.  
   of metals, (P.), B., 359.  
   on rough or shagreened surfaces, (P.), B., 780.  
   on textile fabrics, (P.), B., 1044.  
   impregnation with, of fibrous materials, (P.), B., 463, 1027.  
   of paper and pasteboard, (P.), B., 797.  
   of textile fabrics, (P.), B., 179.  
   solvent losses and recovery in proofing with, B., 593.  
   staining of paper and alcohol by, B., 615.  
   hydrocarbons, constituents of, A., 1036.  
   preparation of isoprene from, A., 1108.  
   production of halide addition products, polymerides, and oxides of, (P.), B., 1093.  
   storage of, (P.), B., 359.  
   preservation of, (P.), B., 34, 197, 198.  
   by surface treatment, B., 236.  
   deterioration of, by frictional contact with other materials, B., 809.  
   by hot water, prevention of, (P.), B., 739.  
   surface deterioration of, B., 1092.  
   treatment of, to retard cracking in sunlight, (P.), B., 34.  
   anti-agers for, (P.), B., 34, 197, 198, 237, 438, 616, 779, 928, 1000, 1094.  
   antioxidants for, (P.), B., 34, 120, 153, 237, 460, 520, 689, 809\*, 950.

**Rubber**, manufacture of conversion products of, (P.), B., 651.  
 conversion of, into hard material, (P.), B., 1000.  
 manufacture of leather substitute from, (P.), B., 1044.  
 production of resin-like material from, (P.), B., 739.  
 manufacture of threads or strips of, (P.), B., 950.  
 production of varnishes or lacquers containing, (P.), B., 997.  
 compositions of, with gum resins, (P.), B., 650.  
 manufacture of compositions from resins in, (P.), B., 689.  
 for use in dentures, (P.), B., 779.  
 for electric cables, B., 563.  
 for equipment construction, B., 738.  
 substitutes, (P.), B., 359.  
   manufacture of, (P.), B., 438.  
   from petroleum oils, (P.), B., 911.  
   from polyhydric alcohols, (P.), B., 671.  
 measuring microscope for examination of, B., 1093.  
 applications of photometry in analysis of, B., 688.  
 detection and determination of, in its mixtures with asphalt pigments, factice, etc., B., 688.  
**Rubber**, artificial, manufacture of, (P.), B., 33, 237, 438, 689.  
   preservation of, (P.), B., 34.  
   chlorinated, B., 1093.  
   applications of, B., 392, 950.  
   hard, coating of, with soft rubber, (P.), B., 740.  
   methylated, vulcanisation of, B., 738.  
   microporous, manufacture of, (P.), B., 1093.  
   natural and synthetic, A., 276, 1036; B., 902.  
   new and reclaimed, rosin and rosin oil in, B., 119.  
   poor in albumin, production of, (P.), B., 236.  
   porous, production of, (P.), B., 476, 950.  
   porous or micro-porous, manufacture of, (P.), B., 358, 950.  
   raw, baling of, B., 949.  
   plasticisers for, (P.), B., 999.  
   viscosity of solutions of, in mixed solvents, B., 615.  
   evaluation of, B., 155.  
   determination in, of moisture, nephelometrically, B., 563.  
   reclaimed and masticated, dispersions of, B., 949.  
   regenerated, production of insulating materials from, (P.), B., 438.  
   sheet, production of, (P.), B., 950.  
   adsorption of oxygen by, A., 991.  
   plantation, variation in, B., 614.  
   sodium, destructive distillation of, A., 276.  
   sponge, manufacture of, B., 236; (P.), B., 563.  
   manufacture of balls of, B., 236.  
   stretched, electrical properties of, B., 273.  
   synthetic, A., 1232; B., 156.  
   unvulcanised, treatment of, (P.), B., 438.  
   vulcanised, reclaiming of, (P.), B., 120.  
   recovery of, (P.), B., 739.  
   physical characteristics of, B., 519.  
   effect of grit in carbon black on flexing resistance of, B., 631.  
   influence of free sulphur on ageing of, B., 779.

**Rubber**, vulcanised, dielectric constant and power factor of, B., 650.  
 effect of vulcanisation temperature on, B., 650.  
 chloroform extraction of, B., 476.  
 "copper destruction" of, B., 197.  
 influence of temperature on evolution of hydrogen sulphide from, B., 950.  
 determination of free sulphur in, volumetrically, B., 156.  
 waste, production of unsaturated hydrocarbons from, (P.), B., 1093.  
**Rubber articles**, manufacture of, (P.), B., 33, 316, 358, 437, 615, 903, 904, 999.  
   by electrodeposition, (P.), B., 33.  
   by filtration, forms for, (P.), B., 33.  
   from latex, (P.), B., 779.  
   vulcanisation of, (P.), B., 809.  
   moulds for, (P.), B., 273.  
   application of variegated colourings to surfaces of, (P.), B., 237.  
   determination of hardness of, B., 949.  
   influence of conditions of storage on deterioration of, B., 563.  
   of high flexing capacity, manufacture of, (P.), B., 739.  
   containing vegetable fibres, recovery of constituents from, (P.), B., 520.  
   composite, manufacture of, (P.), B., 999.  
   dipped, manufacture of, (P.), B., 393.  
   fibrous, manufacture of, (P.), B., 120.  
   microporous, uniting of, (P.), B., 34.  
   moulded, production of, (P.), B., 476.  
   resembling wood, moulding of, (P.), B., 198.  
**Rubber compositions**, (P.), B., 651.  
   manufacture of, (P.), B., 157, 738, 739, 1043.  
   for soles of footwear, (P.), B., 257.  
   adhesive, (P.), B., 903.  
   production of, (P.), B., 739.  
   bituminous, production of, (P.), B., 780.  
   plastic, treatment of, (P.), B., 916.  
   tacky, production of, (P.), B., 615.  
**Rubber compounds**, manufacture of, (P.), B., 779, 903.  
   product from pine-tar for use in, (P.), B., 1067.  
   vulcanisable, manufacture of, (P.), B., 999.  
**Rubber diaphragms**, corrugated, for separators in electric batteries, etc., (P.), B., 433.  
**Rubber fabrics**, production of, (P.), B., 418, 503, 1044.  
   natural and artificial ageing of, B., 303.  
   with fibre coating, production of, (P.), B., 932.  
   textile, weaving of, (P.), B., 257.  
**Rubber filaments**, manufacture of, (P.), B., 740.  
**Rubber flooring**. See under Floors.  
**Rubber goods**, manufacture of, B., 1092; (P.), B., 34, 358, 689, 739, 950, 1000.  
   moulding and vulcanisation of, (P.), B., 237.  
   hard and soft, production of, (P.), B., 809.  
   unstretched, atmospheric cracking of, B., 615.  
**Rubber hose**, for use in breweries, B., 365.  
**Rubber industry**, impurities of importance to, B., 236.  
**Rubber latex**, B., 808.  
   treatment of, (P.), B., 120, 903, 998.  
   purification of, (P.), B., 779.  
   concentration of, (P.), B., 273, 738, 779.  
   centrifugally, (P.), B., 519.  
   by the creaming process, (P.), B., 779.  
   concentration and compounding of, B., 357.

**Rubber latex**, thickening and stabilisation of, (P.), B., 738.  
 incorporation of pigments in, (P.), B., 520.  
 preservation of, (P.), B., 393, 564.  
   with alkalis, (P.), B., 903.  
 use of, B., 357.  
 processes for application of, B., 154.  
 manufacture of articles from, (P.), B., 689.  
 production of cleaning compositions from, (P.), B., 30.  
 production of quebrachitol as a by-product from, B., 615.  
 production of articles from fibrous materials and, (P.), B., 809.  
 treatment of fibres with, (P.), B., 933.  
 impregnation of permeable substances with, (P.), B., 237.  
 ornamentation of surfaces with, (P.), B., 33.  
 serum, production of moulding compositions from, (P.), B., 780.  
 concentrated, uses of, B., 236.  
**Rubber materials**, manufacture of, (P.), B., 1043.  
   for floors, etc., (P.), B., 903.  
   for shoes, etc., (P.), B., 999.  
   containing cork, (P.), B., 35.  
   expanded, manufacture and use of, (P.), B., 33.  
   fibrous, production of, (P.), B., 615.  
   determination in, of copper, B., 503.  
**Rubber mixtures**, (P.), B., 999.  
   control of kneading and mixing of, (P.), B., 951.  
   mixing and manipulating of, (P.), B., 809.  
   measurement of plasticity of, (P.), B., 5.  
   containing accelerators, prevention of scorching of, (P.), B., 651.  
   containing gas-black, effect of grit on tensile properties of, B., 197.  
**Rubber plants**, manuring of, B., 72.  
   green manuring of, B., 278.  
   effects of sulphur dusting on yield and bark renewal of, B., 571.  
**Rubber products**, manufacture of, (P.), B., 903, 950.  
   for sealing punctures in pneumatic tyres, (P.), B., 950.  
**Rubber seed**, storage of, B., 614.  
   products from, B., 808.  
   *Hevea*, and products therefrom, B., 697.  
**Rubber tape**, manufacture of, (P.), B., 316.  
**Rubber threads**, manufacture of, (P.), B., 520.  
**Rubber tiles**, uniting of, to bituminous layers, etc., for roads, (P.), B., 35.  
**Rubber tubing**, leakage of carbon dioxide through, B., 903.  
   containing antimony sulphide, for use with foods, B., 1127.  
   heat-resistant, B., 651.  
**Rubicons**, constitution of, A., 839.  
**Rubidium**, isotopic constitution and atomic weight of, A., 209.  
   absorption spectrum of, A., 979.  
   Stark effect for, A., 979.  
**Rubidium azide**, crystal structure of, A., 114.  
   bromide, crystal structure of, A., 1192.  
   chloride, activation of zymase by, A., 544.  
   chloroplatinate, crystal structure of, A., 564.  
   fluoroiodochloride, A., 823.  
   iodides, A., 1216.  
   sulphate, heat of dilution of, A., 23.  
   dithionate, structure of, A., 1079.

Rubidium detection:—  
detection of, A., 922.  
 Rubrene, hydrogenation of, A., 374.  
 oxidation of, A., 507.  
 isomers of, A., 374.  
 Rubrenes, constitution of, A., 732.  
 formation of, A., 260.  
 Rubrenedicarboxylic acid and its sodium salt, and their dissociable oxides, A., 570.  
 Rue oil, Algerian and Spanish, methyl *n*-octyl ketone in, A., 1179.  
 Ruffianic acid, salts, decomposition of, by wool, A., 1182.  
*Rumex acetosella*, reaction of soils for, A., 205.  
 Ruthenium, spark spectrum of, A., 2.  
 and its carbide, electrical conductivity of, A., 328.  
 atomic heat of, A., 220.  
 specific heat of, A., 13, 220.  
 Ruthenium alloys, for pen points, (P.), B., 1088.  
*Ruwettus pretiosus*, composition of oil of, A., 313.  
 Rye, effect of sodium chloride on growth of, B., 318.  
 influence of soluble and insoluble aluminium on nutrient intake of, B., 856.  
 detection of, in wheat flour, B., 239.  
 Rye flour, effect of benzoyl peroxide on, B., 398.  
 salicylic acid reaction with, B., 398.  
 detection of, in wheat flour, B., 1004.  
 determination of, B., 815.  
 Rye-germ oil, B., 899.  
 Rye grass, glucosides of, A., 662.  
 wax constituents of, A., 204.  
 Italian, composition of, B., 953.  
 Rye seeds, loss in germinating power of, on storage, B., 697.  
 influence of time on activity of, used in seedling method, B., 855, 1129.

## S.

SS-acid, Chicago, adulteration of, B., 1070.  
 Sabadilla, determination of alkaloids in seeds of, B., 623.  
 Saccharic acid, mechanism of formation of, from sugars, A., 144.  
 potassium salt, action of potassium cyanide on, A., 1113.  
 Saccharimetry, optical rotatory power of Czecho-Slovakian standard quartz plates for, B., 1050.  
 Saccharin (*o*-benzoisulphinide), reduction of, electrolytically, A., 1046.  
 formation of *o*-chlorobenzoic acid by action of chlorine on, A., 1029.  
 detection of, microchemically, A., 763, 867.  
 determination of, colorimetrically, in beverages, B., 445.  
 in foods and beer, B., 399.  
 Saccharogen-amylase, potato, action of salts on, A., 665.  
*Saccharomyces cerevisiae*, growth and enzymic activity of, in presence of potassium and sodium, A., 1288.  
 Saffron, analysis of, B., 816.  
 detection in, of adulterants by capillary analysis, B., 1103.  
 of glycerol and sugars, B., 1054.  
 Safranines, manufacture of aryl derivatives of, (P.), B., 222.  
 Safrole, manufacture of derivatives of, (P.), B., 138.  
 decomposition products of, A., 510.

*iso*Safrole nitrosite, A., 943.  
 Salamander, marble, poison of skin-glands of, A., 639.  
 Salamander alkaloids, pharmacology of, A., 1163.  
 Salicin, coupling of, with hydroxyanthraquinones, A., 370.  
 2-Salicylalizarin, and its sodium salt, A., 370.  
 Salicylaldehyde, condensation product of, with dibenzyl ketone, and its phenylhydrazone, A., 273.  
 sodium salt, chelation of, and its aldoxime and phenylmethylhydrazone, and their 2:4-dinitrophenyl ethers, A., 513.  
 determination of, and its separation from saligenin and salicylic acid, A., 411.  
 Salicylaldehyde, 5-bromo-, semicarbazone, A., 946.  
 Salicylaldehyde-phosphoric acid, dephosphorylation of, A., 427.  
 Salicylaldoxime, and its methyl ether, copper derivatives of, and their use in detection of copper, A., 160.  
 Salicylamide-acetone. See 4-Keto-2:2-dimethyl-3:4-dihydro-1:3-benzoxetoxazine.  
 Salicylamide-4-arsinic acid, A., 180.  
 Salicylic acid, heat of combustion of, A., 23.  
 absorption of, in the mouth, A., 965.  
 resorption of, from ointments, A., 89.  
 fate of, in the body, A., 647.  
 complex vanadium compounds of, A., 31.  
 salts, colour changes in solutions of, B., 1135.  
 effect of, on uric acid, A., 425.  
 bismuth salt, detection in, of lead, B., 723.  
 alkyl esters, and their 3:5-dinitroderivatives, A., 1246.  
 methyl ester, purification of, (P.), B., 414.  
 compound of, with boron trifluoride, A., 728.  
 phenyl ester (*salol*), heat of combustion of, A., 229.  
 crystallisation of films of, A., 1078.  
*p*-phenylphenacyl ester, A., 745.  
 as an alkalimetric standard, A., 135.  
 as calorimetric standard, A., 913.  
 detection of, in foods and wines, in presence of benzoic acid, B., 700.  
 in rye bread, B., 525.  
 in wines, B., 281.  
 determination of, in presence of 2-phenylquinoline-4-carboxylic acid, A., 955.  
 and its separation from saligenin and salicylaldehyde, A., 411.  
 Salicylideneacacenaphthenone, A., 750.  
 Salicylideneacetophenone, *mono*- and *di*-bromo-, and *mono*-, *di*-, and *tri*-chloro-, A., 949.  
 Salicylidene-*p*-chloroacetophenone, A., 949.  
 Saligenin, determination of, and its separation from salicylic acid and salicylaldehyde, A., 411.  
 Saligenin- $\beta$ -*D*-galactoside, synthesis of, and its tetra-acetate, A., 501.  
 Salinigrin, composition of, A., 370.  
 Saliva, stability of calcium in, A., 533.  
 phosphorus of, in relation to dental caries, A., 1278.  
 hydrolysable phosphorus compounds of, A., 766.  
 horse, group-specific substance of, A., 1275.  
 parotid, of dog's, A., 533.  
 human, passage of ethyl alcohol into, A., 1162.  
 determination in, of urea, A., 639.  
*Salix fragilis*, nitrogen in leaves of, A., 660.  
*Salol*. See Salicylic acid, phenyl ester.

Salmon, death of, in estuary of River Tees, B., 626.  
 Salmon oil, containing vitamins, B., 354.  
 Pacific Coast, vitamin-A in, B., 70.  
 Salts, preparation and purification of, by base-exchange, A., 1007.  
 production of, from brines and solutions, (P.), B., 304.  
 from their solutions by spraying, (P.), B., 1109.  
 purification of, with zeolites, A., 30.  
 activity coefficients of, in acetic acid solution, A., 339.  
 influence of sucrose on electrolytic conductivity of aqueous solutions of, A., 230.  
 surface conductance at interfaces of glass and solutions of, A., 699.  
 fusion at high pressure and metamorphism of, A., 22.  
 fused, state of, A., 111.  
 two-part anodes for electrolysis of, (P.), B., 515.  
 of low m.p., A., 800.  
 diffusion of, through gels, A., 804.  
 solubility of, at high temperatures, A., 457, 1205.  
 effect of water and alcohols on, in acetone, A., 1197.  
 in liquid ammonia, A., 1197.  
 apparent volume of, in solution, A., 335, 461.  
 effect of, on properties of solutions of non-electrolytes, A., 1200.  
 velocity of solution of, in water, A., 345.  
 crystallisation of, (P.), B., 505.  
 decomposition of, (P.), B., 305.  
 dehydration of, A., 29.  
 with organic liquids, A., 585.  
 hydrolysis of, as shown by Raman effect, A., 228.  
 coloration of, by radium rays, A., 1007.  
 basic, A., 914.  
 complex, A., 809, 1101.  
 in solution, A., 350.  
 and circular dichroism, A., 709.  
 activation of, in aqueous solution, A., 578.  
 crystalline. See Crystalline salts.  
 double, crystal structure of, A., 1079.  
 hydrated, transition temperatures of, A., 996.  
 rate of dissociation of, A., 26.  
 optically isomeric, solubility relationships of, A., 263.  
 See also Metallic salts.  
 Salt mixtures, Osborne-Mendel, modification of, A., 539.  
 Salt-pans, Brazilian, A., 596.  
 Salt solutions, alkaline, detergency of, B., 546.  
 Salvasan (*arsphenamine*; *diaminodihydroxyarsenobenzene hydrochloride*), and its derivatives, absorption spectra of, A., 180.  
 properties of preparations of, B., 448.  
 Samanin, A., 975.  
 Samarium, absorption spectra of, A., 1188.  
 magnetic susceptibility, gyromagnetic ratio, and heat capacity of, A., 217.  
 Samarium chloride, line reflexion spectrum of, A., 557.  
 hexahydrate, comparison of reflexion and absorption spectra of, A., 6.  
 nitrate, thermal decomposition of, in carbon dioxide, A., 132.  
 sulphate, magnetic susceptibility of, A., 900.  
 Sanbornite, Californian, A., 1228.

- Sand or Sands, apparatus for washing of, (P.), B., 629.  
 tank for washing of, (P.), B., 889.  
 apparatus for counting grains of, A., 926.  
 permeability of, to gases at high temperatures, B., 361.  
 suspension of, in water, B., 1059.  
 for filters, granulometric test of, B., 707.  
 beach, of New South Wales, A., 248.  
 glass, determination of iron in, volumetrically, B., 104.  
 oil, treatment of, B., 710.  
 recovery of oil from, (P.), B., 587.  
 permian yellow, of N.E. England, A., 595.  
 tertiary, in the subsoil of Hamburg, A., 495.
- Sandalwood, and its substitutes, B., 864.  
 Sandalwood resin, B., 196.  
 Sandstone, Elbe, coloured efflorescences on, A., 596.  
 Sanitary compositions, manufacture of, (P.), B., 242.  
 Santenane, preparation of, A., 857.  
 Santenone hydrazone, acetyl derivative, A., 857.  
 Santol wood, composition of, B., 385.  
 Santonin, extraction of, B., 1007.  
 and its derivatives, refractive indices of, A., 214.  
 solubility of, in benzene, B., 576.  
 production of substitutes for, (P.), B., 1055.  
 antidiabetic action of, A., 302.  
 determination of, and its 2:4-dinitrophenylhydrazones, A., 948; B., 863.  
 in *Artemisia*, B., 1136.  
 in chocolate, B., 482.  
 in drugs, B., 1136.  
 in plants, B., 1136.
- Santonin series, A., 271.  
 Santoninic acid, refractive indices of, A., 214.  
 Sapo kalinus, B., 1089.  
 Sapogenins, A., 397.  
 dehydrogenation of, A., 603.  
 sugar-beet, and its derivatives, A., 46.
- Saponaria officinalis*, distribution of saponins in, A., 313.  
 Saponins, A., 61, 397.  
 in vegetable drugs, B., 1136.  
 action of, on membrane and tissue constituents, A., 877.  
 in foods in relation to health, A., 541.  
 physiological action of, A., 1164.  
 determination of, A., 856.
- Saponin series, A., 397, 516, 856, 1140.  
 Sapotalin, synthesis and constitution of, A., 277, 603.  
*Sarcina lutea*, effect of light on oxygen consumption by, A., 93.  
 Sarcoma, chicken, enzymes of, A., 418.  
 multiple inoculation, deposition of calcium compounds in, A., 80.  
 Rous chicken, filterable agent of, A., 1157.  
 Rous minced, biochemical activity of, after filtration, A., 536.
- Sarcosine amide glucoside, penta-acetyl derivative, A., 605.  
 Sarcosine anhydride, preparation of, A., 48.  
*Sarcostemma australe*, poisoning of animal stock by, B., 201.  
 Sarcosylglycine, ethyl ester, A., 605.  
 Sarcosylsarcosine, preparation of, A., 48.  
 Sardine oil, solid glycerides of, A., 931.  
 polymerisation of methyl esters of unsaturated acids of, A., 498.  
 Sarmenocymarin, sugar from, A., 724.  
 Sarmenose, A., 724.
- Sauerkraut from pretreated cabbage, B., 1006.  
 Sauerkraut juice, pharmacology of, A., 966.  
 Sausages, chemical composition of, B., 815.  
 ink for marking casings of, (P.), B., 1041.  
 tinned, evaluation of, B., 45.  
 analysis of, B., 959.
- Sawdust, heating of, under pressure in presence of reduced iron, B., 966.  
 oak. See Oak sawdust.
- Scale, removal of, from heaters, etc., (P.), B., 1013.  
 green. See *Coccus viridis*.  
 San José and scurvy, control of, with tar-distillate sprays, B., 812.
- Scandium, isotopic constitution and atomic weight of, A., 209.  
 geochemistry of, A., 926.
- Scandium detection :—  
 detection of, spectroscopically, A., 1074.  
 Scapolite, crystal structure of, A., 218.
- Schaffer's acid, preparation of, B., 138.  
 Schaum's phenomenon, A., 804.
- Schiff's bases, constitution of, A., 253.  
 reduction of, A., 378, 1123.  
 decomposition by water of bromides of, A., 742.  
 aromatic, iodides of, A., 742.
- Sehnebergite, crystal structure of, A., 450.  
 Schreibersite, in Chilean hexahedrite, A., 1230.
- Schweitzer's reagent, preparation of cellulose in, A., 725.
- Sciadopitys verticillata*, essential oil from, B., 321.
- Scilla*, biological assay of tinctures of, B., 1136.
- Sclareol, and its derivatives, A., 399.
- Sclerosis, multiple, blood-enzymes in, A., 1280.
- Scolecite, vicinal faces on, A., 450.
- Scomber scombrus*. See Mackerel.
- Scombrotoxin saurus*, constituents of oil from, A., 200.
- Scorodite, Japanese, A., 715.
- Screening apparatus, (P.), B., 407, 532, 821.  
 for coke, etc., (P.), B., 661.  
 for liquids and pastes, (P.), B., 373.  
 rotary, (P.), B., 1108.  
 rotary drum, (P.), B., 661.
- Screening constants, for many-electron atoms, A., 208.
- Scurvy, potassium and sodium in blood and muscle in, A., 419.  
 hexuronic acid treatment of, A., 548.  
 effect of potassium and sodium on, A., 769.  
 distinction between Moeller-Barlow disease and, A., 1173.  
 experimental, A., 419, 887, 1294.  
 bones in, A., 297.  
 chlorine in, A., 297.
- Scymnol, constitution of, and its derivatives, A., 268.
- Scymnorhinus lichia*. See Shark-liver oil.
- Sea anemone, effect of salinity of medium on respiration of, A., 420.
- Sea perch, vitamin-D content of fat of, A., 887.
- Sea perch oil, B., 850.
- Seal, vitamin-D content for fat of, A., 887.
- Seals, water-tight, A., 491.
- Sealing compositions, (P.), B., 688.
- Seaplanes, metal, corrosion in, B., 348.
- Seaweed, treatment of, (P.), B., 652.  
 See also Algae, marine.
- Sebacamidine picrate, A., 55.
- Sebacic acid, *p*-phenylphenacyl ester, A., 745.
- Sebacic anhydrides, polymerisation of, A., 601.
- Sebastes marinus*. See Sea-perch.
- "Sebbach el Kom." See "Kufri."
- Secale cereale*, histamine-like substance in pollen of, A., 1179.
- Secretin, A., 1171.  
 standardisation of, A., 1067.
- Sediments, escape of gas in, A., 595.
- Sedimentation, regional, A., 461.
- Sedimentation analysis. See under Analysis.
- Sedimentation apparatus, (P.), B., 661, 965.  
 acid-proof, (P.), B., 86.
- Sedimentation tanks, rotary apparatus for, (P.), B., 580.
- Seeds, treatment of, B., 569, 1097.  
 with hormone preparations, (P.), B., 1003.  
 use of hot water and organic mercurials in, B., 39.  
 respirometer for study of, A., 783.  
 catalase in, A., 887.  
 enzyme content of, A., 1296.  
 quality of, from enzyme content, A., 548.  
 hexosediphosphatedehydrogenase and carboxylase in, A., 1062.  
 micro-organisms on or in, A., 205.  
 development of oil in, A., 202.  
 oil content of, B., 569.  
 germination of, in relation to sugar and hydrocyanic acid content, B., 1130.  
 effect of Italian radioactive soils on, A., 661.  
 effect of mercury salts on, A., 784.  
 solutions for accelerating germination and growth of, (P.), B., 956.  
 stimulation of growth of, (P.), B., 908.  
 breaking of dormancy of, B., 396.  
 adhesion of pickling dusts to, B., 441.  
 dressing of, (P.), B., 75, 125.  
 disinfectants for, (P.), B., 524.  
 ethyl mercury compounds as, B., 782.  
 disinfection of, with synthetic tannins, B., 75.  
 production of blocks for planting of, (P.), B., 125.  
 influence of plant sap on longevity of legume bacteria on, B., 200.  
 germinating, utilisation of nitrogen by, A., 436, 1180.  
 graminaceous, germination of, in relation to pH of media, B., 954.  
 oleaginous, composition of, in relation to geographical distribution, A., 663.  
 microscopic analysis of, B., 131.  
 determination in, of phosphorus, A., 978.  
 of water, B., 685.
- Selenides, aromatic, crystal structure of, A., 987.
- poly*Selenides, parachor measurements of, A., 112.
- Selenium, B., 845.  
 atomic weight of, A., 442, 980.  
 isotopes of, A., 790.  
 nuclear moment of, A., 209.  
 arc spectrum of, A., 668.  
 fluorescence spectrum of, A., 103.  
 resonance spectrum of, A., 551.  
 catalytic action of metals on photoconductivity of, A., 560.  
 heat capacity of, at high temperatures, A., 988.  
 as catalyst in determination of nitrogen by Kjeldahl method, A., 1221.  
 and its dioxide, reactions of, with nitrogen oxides, A., 1100.  
 in plants, A., 976.  
 fungicidal action of sulphur, tellurium, and, B., 1048.  
 effect of, in rubber mixings, B., 197.



- Selenium hexafluoride, physical properties of, A., 905.  
 hydride, physical properties of, A., 454.  
 dioxide, molecular volume of, A., 1190.  
 density and dissociation of vapours of, A., 328.  
 use of, as oxidising agent, A., 833, 1103, 1253.  
 as reagent for hydrazine and its analogues, A., 487.  
 dithiophosphates, (P.), B., 886.  
 Selenious acid, dehydration of, A., 133.  
 Selenium organic compounds, A., 70.  
 Selenium mono- and di-phenyl bromides, A., 762.  
 Selenic acid, esters, A., 484.  
 Selenium determination:—  
 determination of, with hydrazine, A., 1102.  
 in materials for electrolytic copper plant, B., 987.  
 Selenobenzaldehydes, A., 631.  
 Selenobenzoic acid, benzyl ester, A., 382.  
 Selenobisacetaldehyde di-*p*-nitrophenyl-hydrazine, A., 1148.  
 Selenobisdiethylacetal, A., 1148.  
 Selenocyanammines, A., 484, 1099.  
 Selenolricinic acid, and its barium salt, A., 526.  
 Selenolricinineacetic acid, and its sodium salt, A., 526.  
 Selenotropinone, and its dipiperonylidene derivative, A., 1148.  
 Semecarpol, A., 102.  
*Semecarpus anacardium*, constituents of, A., 102.  
 Semicarbazide, determination of, iodometrically, A., 937.  
 $\beta$ -Semicarbazidopropaldehyde semicarbazone, A., 1249.  
 Semicarbazones, formation of, A., 916.  
 Seminal vesicles of guinea-pigs, fatty acids and cholesterol in, A., 185.  
*Senecio*, alkaloids from species of, A., 286.  
*Senecio jacobaea* and *retrosus*, necic acids and necines from, A., 286.  
*Senega*, evaluation of extracts of, B., 1136.  
 Separators, (P.), B., 405, 821.  
 for coal, etc., (P.), B., 1012.  
 for dry materials, (P.), B., 132.  
 for liquids, (P.), B., 165, 965.  
 for solids, (P.), B., 661, 868.  
 air, (P.), B., 756, 1109.  
 for grading materials, (P.), B., 661.  
 centrifugal, (P.), B., 4, 51, 86, 212, 244, 373, 405, 486, 581, 629, 662, 708, 788, 965, 1013, 1060, 1061, 1108.  
 bearings for, (P.), B., 1013.  
 bowls for, (P.), B., 132, 212, 293, 453, 822.  
 collecting vessels for, (P.), B., 132.  
 regulation of supply of liquid to, (P.), B., 406.  
 supply and discharge pipes for, (P.), B., 789.  
 with closed inlet or outlet for liquid, (P.), B., 453.  
 for dusts, (P.), B., 244.  
 dry, (P.), B., 1060.  
 magnetic, (P.), B., 115.  
 pneumatic, (P.), B., 132, 213.  
 rotary, (P.), B., 756.  
 Septicæmia, experimental streptococcus, blood changes in, A., 82.  
*iso*Serine, stereoisomerism of, A., 1118.  
 Serinephosphoric acid, salts of, from hydrolysis of vitellinic acid, A., 1269.  
 Serine-*N*-sulphonic acid, and its potassium salts, A., 1023.  
 Serpentine, and its salts, A., 203.  
 Serpentinine, and its salts, A., 203.  
 Serposterol, A., 203.  
 Serum, critical temperature of, A., 412, 764.  
 colloid-osmotic pressure of, A., 763, 764.  
 changes produced in, by dilution, A., 635.  
 neutralisation curves of, A., 293.  
 action of, with ether, A., 1053.  
 albumin and globulin contents of, A., 960, 1271.  
 antigen content of, in disease, A., 960.  
 antigenic property of, A., 414.  
 effect of diet and secreting organs on calcium in, A., 1171.  
 influence of kidneys on calcium in, A., 1272.  
 diffusible and non-diffusible calcium in, A., 635, 1053.  
 retention of carbon dioxide by, A., 644.  
 extraction of lipins of, A., 531.  
 pigments, spectrochemical analysis of, A., 1151.  
 proteins, A., 293.  
 refractometry of, A., 412, 635.  
 fractionation of, A., 1152.  
 adsorption and elution of, A., 1088.  
 effect of electrolytes with, A., 956.  
 specificity of, A., 1153.  
 separation of antibodies from, A., 884.  
 precipitation and protection of vanadic acid by, A., 1271.  
 horse, determination of, A., 412.  
 of eels, A., 764.  
 determination of, A., 183, 1271.  
 microchemically, A., 868.  
 anti-meningococcic, standardisation of, A., 884.  
 anti-pneumococcus, precipitation of, by ethyl alcohol, A., 779.  
 horse, dissociation of protein precipitate of, A., 1290.  
 antitoxic and normal, paraglobulins of, A., 183.  
 anti-vaccine, A., 95.  
 heated immunised, viscosity of, and its antibody, A., 414.  
 horse, ultra-violet absorption spectrum of, A., 764.  
 dilution of, in electrolytic solutions, A., 956.  
 immunised, distribution of protective principle in, A., 1054.  
 horse and rabbit, proteases in, A., 1053.  
 human, ultrafiltration of calcium and magnesium from, A., 636.  
 lipins in, in health and in cancer, A., 418.  
 proteins of, A., 418.  
 determination of albumin-globulin ratios in, A., 73.  
 immune, antigens from organic acids with, A., 183.  
 normal and pathological, ferric iron content of, A., 82.  
 rabbit's, variation of calcium in, A., 635.  
 calcium and phosphates in, A., 183.  
 therapeutic, optical density and viscosity of, A., 868.  
 determination in, of alkali reserve, A., 635.  
 of carotene, A., 636.  
 of free, protein-, and non-protein-sugar in, A., 75.  
 Serum-albumin. See under Albumin.  
 Serum-globulin. See under Globulin.  
 Serylprolyltyrosylproline, isolation of, in degradation of silk fibroin, A., 1141.  
 Sesamé oil, from the Far East, B., 850.  
 detection of, in margarine, B., 30.  
 Sesquioxides, separation of, from alkaline-carths in soil analysis, B., 1046.  
 Sesquiterpenes, A., 277.  
 Settling apparatus, (P.), B., 661.  
 Sewage, treatment of, B., 706; (P.), B., 82, 450.  
 plant with submerged contact aerators for, (P.), B., 626.  
 collection and storage of gas from, (P.), B., 290.  
 digestion of coarse substances left on screens in, (P.), B., 626.  
 in Chicago, B., 1057.  
 in New Jersey, B., 529.  
 activated-sludge treatment of, at Collingswood, N.J., B., 209.  
 influence of  $p_H$  on, B., 962.  
 plant with brush aeration for, B., 705.  
 disposal of, by activated-sludge process at Phoenix, Ariz., B., 865.  
 by activated-sludge process at Salinas, Calif., B., 865.  
 apparatus for, (P.), B., 866.  
 in New York City region, B., 1057.  
 purification of, (P.), B., 370.  
 plant for, (P.), B., 82.  
 regulation of chlorine in, (P.), B., 402.  
 rôle of bacterial enzymes in, B., 1105.  
 chlorination of, B., 369.  
 sedimentation of, B., 1057.  
 sedimentation and chlorination of, B., 1057.  
 aeration of, B., 242.  
 pre-aeration plant for, at Decatur, B., 209.  
 filtration of, and incineration of sludge, B., 866.  
 separate removal of floating and non-floating substances from, (P.), B., 210.  
 digestion of scum from preliminary settling tanks for, B., 130.  
 concentration and distribution of solids in, during digestion, B., 162.  
 heat and energy relations in digestion of solids of, B., 866, 1058.  
 thermophilic digestion of solids of, B., 130.  
 disposal of grit and screenings from, by incineration, B., 866.  
 dehydration of waste precipitates from, B., 914.  
 removal of suspended solids and production of gas by Imhoff tanks for, at Decatur, Ill., B., 1138.  
 fluorescence of, B., 242.  
 dilution of, in the sea, B., 402.  
 physical chemistry of colloids in, B., 1057.  
 investigations on, at University of Illinois, B., 209.  
 effect of  $p_H$  on distillation of free ammonia nitrogen from, B., 530.  
 formation of hydrogen sulphide in, B., 1105.  
 indole and skatole in, B., 369.  
 fuel value of solids of, B., 664.  
 effect of dilution water on determination of biochemical oxygen demand of, B., 162.  
 reduction of biochemical oxygen demand of, by chlorination, B., 705.  
 containing effluent from cellulose factories, fertilising value of, B., 694.  
 analysis of, B., 753.  
 Sewage effluents, biological determination of quality of, B., 530.  
 Sewage sludge, dewatering and treatment of, (P.), B., 754.  
 removal of, from settling tanks, B., 705.  
 settling and filtration of, (P.), B., 1058.  
 digestion of, B., 209, 530; (P.), B., 1010.  
 apparatus for, (P.), B., 82.

- Sewage sludge**, digestion of, plant for, B., 1058.  
 changes in, B., 530.  
 heat and energy relations in, B., 1138.  
 acceleration of, by heating, B., 530.  
 effect of coagulants on, B., 1058.  
 effect of enzymes on, B., 1138.  
 effect of gases on, B., 705.  
 collection of gases from, B., 705.  
 relation between organic matter and gas produced during, B., 914.  
 effect of sulphates on hydrogen sulphide production in, B., 1138.  
 digestion and disposal of, B., 1058.  
 multi-stage digestion of, at Los Angeles, B., 210.  
 depth of beds for drying of, B., 1057.  
 decomposition chambers for, (P.), B., 1106.  
 gas yield from, B., 866.  
 utilisation of gases from, for power, B., 1057.  
 as a fertiliser, B., 694, 866, 706.  
 activated, effect of industrial waste water on, B., 1058.  
 determination in, of moisture, B., 1138.
- Sex**, determination of, A., 877.  
 colour reactions for, in man, animals and plants, A., 76.  
 difference of oxidation properties of tissues with, A., 1281.
- Shaking apparatus**, A., 247.  
 high-speed, under pressure, B., 1011.
- Shale**, separation of coal and, (P.), B., 827.  
 carbonisation of, (P.), B., 873, 921.  
 distillation of, (P.), B., 827.  
 retort for, (P.), B., 89.  
 destructive, (P.), B., 536.  
 subterranean oxidation of, A., 249.  
 oil, Estonian, treatment of, B., 790.  
 South African, determination of forms of sulphur in, B., 166.
- Shale oil**, Estonian, desulphurisation of, B., 535.  
 yield of lubricating oil from, B., 88.  
 Manchurian, cracking of, B., 968.
- Shark-liver oil**, glyceryl ether-esters of, A., 1275.  
 of low iodine value, B., 516.
- Shea fat**, composition of, B., 30.
- Sheep**, pigment in sweat and urine of, A., 417.  
 nutrition of, A., 773.  
 with titanium oxide, A., 426.  
 maintenance requirements of, A., 86.  
 cystine in relation to wool formation in, A., 646.  
 baits for blow-flies from, B., 478.  
 dip for, (P.), B., 270.  
 iron licks as treatment for bush sickness of, B., 698.  
 Australian parasitological trials with, B., 478.  
 fed on calcium-deficient diet, effect of lime and cod-liver oil on, A., 962.  
 merino, production of wool fleece by, A., 772.  
 nomogram for metabolism, weight, and surface area of, A., 772.
- Sheep-skins**, pickled, moulds in, B., 1094.
- Sheets**, flexible, treatment of, with varnishes, etc., (P.), B., 883.
- Shell**, gas-filled, (P.), B., 1105.  
 high-explosives, charge for, (P.), B., 1010.
- Shellac**, B., 271.  
 constitution of, B., 314.  
 bleaching of, B., 851.  
 fluidity of, B., 851.  
 swelling of, B., 851.
- Shellac**, iodine value of, B., 851.  
 saponification number of, B., 271.  
 composition from, (P.), B., 518.  
 resistance of films of, to air of high humidity, B., 315.  
 effect of orpiment on determination of colophony in, B., 851.  
 determination in, of insoluble matter, B., 315.
- Sherardising**, B., 186.
- Shingles**, copper-plated, manufacture of, (P.), B., 190.  
 weather-proofed, (P.), B., 385.
- Shock**, experimental, effect of, on blood-sugar, A., 879.
- Shot-guns**, cartridges for, (P.), B., 401.
- Shrubs**, ornamental, fertilisers for, B., 1047.
- Shuttles**, production of, from wood, (P.), B., 800.
- Siaresinolic acid**, and its derivatives, A., 61.
- Siccatives**, manufacture of, (P.), B., 614.
- Siderite**, sintering of, (P.), B., 987.
- Siderolite** from Bencubbin, W. Australia, A., 359.
- Siemensite**, use of, in basic open-hearth furnaces, B., 1120.
- Sieves**, agitated, (P.), B., 294.  
 vibrating, stretching of screens of, (P.), B., 407.
- Sieving apparatus**, B., 531.
- Sieving machine**, laboratory, A., 1105.
- Silage**, quality and yield of, in relation to filling conditions, B., 1096.  
 yeasts in, B., 566.  
 influence of water content and addition of sugar on, B., 158.  
 grass. See Grass silage.  
 determination in, of total acids, B., 158.  
 of lactic, acetic, and butyric acids and their salts, B., 1129.
- "Silargel,"** adsorption of intestinal gases by, A., 426.
- Silica gel**, manufacture of, (P.), B., 886, 1119.  
 treatment of, (P.), B., 506.  
 heat of immersion of, in petroleum substances, A., 464.  
 heat of wetting of, in mixtures of water and acetic anhydride, A., 804.  
 vapour pressure of, A., 572.  
 adsorption by, B., 477.  
 at low temperatures, A., 908.  
 gas analysis by, at low temperatures, B., 7.  
 from ammoniacal solutions of heavy metals, A., 908.  
 of cations from ammoniacal solutions, A., 1084.  
 of gases, A., 690.  
 of hydroxides, A., 803.  
 of organic solvents, A., 992.  
 of radon, A., 803.  
 of binary vapour mixtures, A., 459.  
 isothermal equilibria of, with water and ethyl alcohol, A., 16.  
 syneresis of, A., 123.  
 catalysis of esterification by, A., 129.  
 as air dryer in balances, A., 358.  
 active, A., 464.  
 preparation of, B., 179.  
 deposition of, on asbestos, B., 20.  
 regeneration of, (P.), B., 102.
- Silicic acid**. See under Silicon.
- Silicides**, superconductivity of, A., 566.
- Silicochloroform**, Raman spectrum of, A., 897.
- Silicon**, pure, properties of, A., 799.  
 spectrum of, A., 207.  
 evaporation of, A., 828.
- Silicon**, crystallographic relation of, to aluminium, gallium, and germanium, A., 681.  
 explosion regions of mixtures of, with copper and lead oxide, A., 917.  
 reduction of magnesium oxide by, A., 481.
- Silicon alloys**, with aluminium, A., 685; (P.), B., 389.  
 with aluminium and copper, A., 907.  
 with aluminium and magnesium, A., 907.  
 with copper, equilibrium of, A., 1082.  
 with copper and nickel, A., 907.
- Silicon compounds**, structure of, A., 796.
- Silicon tetrabromide**, A., 132.  
 carbide, use of, in metallurgy, B., 229.  
 temperatures in furnaces for, B., 848.  
 manufacture of bonded articles from, (P.), B., 937.  
 manufacture of refractory articles from, (P.), B., 467.  
 powdered, rate of oxidation of graphite and, B., 841.  
 chloride, heat of dissociation of, A., 1187.  
 fluorochlorides, A., 1218.  
 hydride, A., 1218.  
 dioxide (*silica*), fusing of, (P.), B., 983.  
 equilibrium of, with aluminium and zinc oxides, A., 574.  
 with carbon, A., 341.  
 with ferrous oxide, A., 997.  
 with lead oxide, A., 1090.  
 with water, A., 122.  
 energy of immersion of, in liquids, A., 691.  
 combination of hydrogen and oxygen on surface of, A., 25.  
 reaction of, with calcium carbonate, A., 817.  
 manufacture of articles of, (P.), B., 772.  
 composite articles of, (P.), B., 1080.  
 production of porous articles of, (P.), B., 772.  
 fused products of chromium sesquioxide and, A., 124.  
 amorphous, double refraction of, A., 6.  
 double refraction and ultra-violet dispersion of, A., 323.  
 colloidal, removal of, from solutions obtained in treatment of silicates with acids, (P.), B., 340.  
 precipitated, manufacture of, for admixture with rubber, (P.), B., 506.  
 determination of, colorimetrically, A., 354, 1010.  
 volumetrically, in presence of aluminium and iron, A., 1102.  
 in cast and pig iron, B., 939.  
 in refractory materials, B., 147.  
 in silicates, A., 922.  
 in tissues, A., 533.  
 in volcanic tufa, A., 588, 823.
- Silicic acid and silicates**, B., 549.  
 extinction coefficients of suspensions of, A., 693.  
 relation between concentration of, and silica gel produced therefrom, A., 464.  
 adsorption of bacteriophage by, A., 7.  
 in alkaline and acid solutions, A., 124.  
 use of, as fertiliser, B., 38.  
 colloidal, adsorption of nitrogen peroxide by, A., 803.  
 gels, A., 464.  
 setting of, A., 1202.  
 viscosity of, A., 693.  
 rhythmic splitting of, A., 337.
- sols**, electroanalysis of, A., 464.  
 coagulation of, by electrolytes, A., 910.  
 determination of, in apatite and phosphorite, A., 488.  
 in mineral water, A., 243.  
 colorimetrically, in water, A., 34.

- Silicon:—**  
 Monosilicic acid, A., 1200.  
 Silicates, structure of, A., 451, 682.  
 classification of, A., 682.  
 casting and tempering of melts of, B., 181.  
 X-ray and microscopic examination of melts of zirconia and, B., 104.  
 reactions of, with carbon dioxide under pressure, A., 811.  
 production of bonded materials from, (P.), B., 772.  
 of group II elements, thermal expansion of, B., 1120.  
 base-exchange, determination of, in soils, B., 1046.  
 magmatic and non-magmatic, A., 926.  
 natural, base-exchange, production of, (P.), B., 935.  
 determination of, in glass, B., 1120.  
 determination in, of boric acid, A., 354.  
 of silica, B., 549.  
 Persilicates, A., 350.  
 Silicon organic compounds, A., 1050.  
 Silteon determination:—  
 determination of, in aluminium, B., 844.  
 spectroscopically, A., 35.  
 in carborundum, B., 24.  
 in cast and pig iron and steel, B., 552.  
 in steel, B., 1083.  
 Silk, isoelectric point of, A., 1202.  
 effect of  $p_H$  on photochemical decomposition of, B., 302.  
 liquid, properties of, A., 958.  
 degumming of, (P.), B., 719.  
 effect of alkali on, B., 415.  
 delustring of, (P.), B., 979.  
 mordanting of, with chrome alum, B., 502, 1026.  
 oil for processing of, B., 1116.  
 sizing of threads of, (P.), B., 597.  
 weighting of, (P.), B., 338, 418, 1026.  
 recovery of tin compounds from waste liquors from, (P.), B., 103.  
 determination of tin, phosphoric acid, and silicic acid in, B., 931.  
 weighting of materials of, (P.), B., 883.  
 hand-painting on, (P.), B., 517.  
 scouring action of soap on, B., 1116.  
 washing of garments of, (P.), B., 144.  
 felted, preparation of, (P.), B., 302.  
 raw, physical properties of, B., 976.  
 strength and elongation of, B., 766.  
 degumming action of soap on, B., 640.  
 true and wild, properties of, B., 976.  
 wild, isoelectric point of fibroin of, B., 334.  
 Silk, artificial, production of, (P.), B., 256, 336, 461, 595, 929.  
 bobbin and sleeve apparatus for, (P.), B., 417.  
 bobbin-spinning machines for, (P.), B., 60.  
 centrifuges for, (P.), B., 417.  
 in spinning bobbins, (P.), B., 596.  
 by the spinning-box process, (P.), B., 17.  
 spinning caps for, (P.), B., 225.  
 purification of solutions used for, (P.), B., 225.  
 treatment of, (P.), B., 142, 417.  
 with liquids, (P.), B., 500.  
 apparatus for, (P.), B., 18.  
 prior to dyeing, (P.), B., 226.  
 after-treatment of, from spinning-box process, (P.), B., 17.  
 washing of, on perforated bobbins, (P.), B., 931.  
 17\*
- Silk, artificial, spinning of, (P.), B., 978.**  
 by stretch-spinning process, (P.), B., 336.  
 centrifuges for, (P.), B., 675, 769.  
 centrifugal pots for, (P.), B., 97, 500, 1025.  
 machines for, (P.), B., 98, 178, 336, 1116.  
 washing of bobbins used in, (P.), B., 978.  
 supplying spinning fluid for, (P.), B., 380, 596.  
 spinning and after-treatment of, (P.), B., 595.  
 dry-spinning and reduction of lustre of, (P.), B., 17.  
 nozzle head for stretch spinning of, (P.), B., 463.  
 manufacture of spun cakes of, (P.), B., 17.  
 treatment of cakes of, (P.), B., 141, 143, 500.  
 treatment of spun cakes of, (P.), B., 500.  
 apparatus for, (P.), B., 98, 463.  
 treatment, dressing, and device for protection of spun cakes of, (P.), B., 18.  
 free frame for washing and after-treatment of spinning cakes of, (P.), B., 60.  
 washing and after-treatment of cakes of, (P.), B., 178.  
 washing, after-treatment, and drying of spun cakes of, and of filaments, etc., therefrom, (P.), B., 17.  
 working up of cakes of, (P.), B., 719.  
 dehydration and shaping of cakes of, (P.), B., 225.  
 transportation and after-treatment of, wound on bobbins, (P.), B., 18.  
 treatment of skeins of, (P.), B., 258.  
 finishing of, in skeins or cakes, with oil emulsions, (P.), B., 979.  
 delustring of, (P.), B., 875, 979.  
 sizing of, (P.), B., 258.  
 prior to creping, (P.), B., 676.  
 sizing of threads of, (P.), B., 597.  
 apparatus for, (P.), B., 338.  
 doubling and sizing of, (P.), B., 417.  
 composition for sizing of yarns, threads, etc., of, (P.), B., 19.  
 softening agents for materials containing, (P.), B., 839.  
 increased heat-resistance of textiles containing, (P.), B., 839.  
 production of threads of, (P.), B., 257.  
 production of thread coils of, (P.), B., 18.  
 stretching of filaments of, (P.), B., 143.  
 breaking strength and extensibility of, B., 334.  
 consolidation of thread coils of, (P.), B., 303.  
 simultaneous turning and winding of threads of, (P.), B., 502.  
 adsorption by, of dyes, A., 908.  
 of dull lustre, production of, (P.), B., 881.  
 of reduced lustre, production of, (P.), B., 595.  
 cellulose acetate, production of, (P.), B., 256, 977.  
 delustring of, B., 544, 1076.  
 desizing, dyeing, etc., of materials containing, B., 178.  
 swelling of, in aqueous solutions, B., 836.  
 production of pattern effects on, (P.), B., 883.  
 manufacture of textile fabrics of, (P.), B., 226.  
 hollow-filament, B., 177.  
 iodine test for, B., 1022.
- Silk, artificial, cuprammonium, after-treatment of, (P.), B., 930.**  
 working-up of waste liquors from stretch-spinning of, (P.), B., 98, 837.  
 mordanting of, for dyeing with acid and chrome dyes, B., 978.  
 rayon, manufacture of, (P.), B., 977.  
 spinning pots for, (P.), B., 97.  
 purity of raw materials for, B., 638.  
 oil for processing of, B., 1116.  
 analysis of pulp for, B., 638.  
 delustring of, (P.), B., 503.  
 effect of twist on properties of yarns of, B., 96.  
 refraction of polarised light by, B., 767.  
 action of *Penicillium* on, B., 767.  
 cuprammonium, manufacture of, B., 766.  
 cuprammonium and viscose, B., 542.  
 viscose, production of, (P.), B., 256, 335, 675, 929.  
 removal of sulphur from, B., 380.  
 spinning of, B., 880, 1022.  
 incomplete coagulation in spinning of, B., 836.  
 increasing elasticity and strength of, (P.), B., 979.  
 strength and elongation of, B., 836.  
 influence of moisture on, B., 59.  
 increasing lustre of, by dyeing with sulphur dyes, B., 544.  
 mercerising of, (P.), B., 769.  
 regeneration of liquors from, B., 140.  
 Silk fabrics, containing cellulose acetate, degumming of, B., 176.  
 Silk fibroin, viscosity of sols of, and effect of boiling thereon, B., 334.  
 manufacture of aqueous solutions of, (P.), B., 97.  
 progressive degradation of, A., 1141.  
 action of alkaline copper solution on, B., 416.  
 Tussah, hydrolysis of, A., 71.  
 Silk glands, dry matter and water content in, A., 958.  
 Silk mills, disposal of wastes from, at S. Manchester, Conn., B., 706.  
 Silkworms, acidity of h  molymp of, A., 638.  
 kaijo of cocoons of, A., 295.  
 composition of silk-gum from, A., 766.  
 toxicity of coal-tar dyes to, B., 1130.  
 Japanese, green, colouring matter of cocoons of, A., 871.  
 Sillimanite, structure of, and similar minerals, A., 1079.  
 use of, in extrusion dies, B., 23.  
 in Bhandara district, India, A., 247.  
 Sillimanite refractories. See under Refractories.  
 Silumin, structure of, B., 986.  
 properties of, containing copper, A., 567.  
 Silver, origin of, A., 494.  
 in Bolivian minerals, A., 1229.  
 colour and surface structure of, A., 1189.  
 nuclear moment of, A., 667.  
 recovery of, from graphitic and non-graphitic waste, B., 1084.  
 from shale, (P.), B., 472, 731.  
 from zinc ores containing lead, (P.), B., 557.  
 electrolytic recovery of, from photographic fixing solutions, (P.), B., 898.  
 compound for cleaning of, (P.), B., 896.  
 preferred orientation produced by cold-rolling in sheets of, B., 186.  
 and its alloys with copper, relation between mechanical properties of, B., 265.  
 spectrum of, A., 103, 787.

Silver, temperature shift in band spectrum of, A., 551.  
 emission spectrum of, A., 551.  
 photo-electric emission of, A., 316.  
 photo-electric effect from films of alkali metal on, A., 8.  
 electron diffraction and inner potential of, A., 980.  
 diffraction of electrons by crystals of, A., 789.  
 electrodeposition of, (P.), B., 431, 610.  
 electro-plating with, B., 1085; (P.), B., 803.  
 of spoons, etc., (P.), B., 775.  
 analysis of cyanide solutions for, B., 187.  
 production of bright electrodeposits of, from the cyanide bath, B., 645.  
 specific heat of, A., 1194.  
 and its bromide, specific heats of, A., 339.  
 melting of, in high-frequency induction furnaces, B., 845.  
 evaporation of, A., 828.  
 and its alloys with copper, fused, internal friction of, A., 117.  
 solid, surface tension of, at high temperatures, A., 11.  
 rate of diffusion of, into lead, A., 1195.  
 Peltier effect in, in silver nitrate solutions, A., 814.  
 solubility of, in copper, A., 330.  
 explosion during preparation of ammoniacal solution of, A., 582.  
 equilibrium of, with lead, and lead and silver bromides, A., 1205.  
 coating of metals with, (P.), B., 990.  
 solubility of oxygen in, A., 457.  
 effect of pressure on liberation of oxygen from, A., 1090.  
 action of ferric chloride on, A., 1216.  
 and its alloys, formation of sulphide layers on, B., 429.  
 filaments, formation of, on silver sulphide, A., 822.  
 bactericidal activity of, A., 546, 655.  
 oligodynamy of, A., 1067.  
 colloidal, preparation of, A., 1086.  
 absorption spectrum of solutions of, A., 691.  
 magnetism of precipitates of, A., 225.  
 sols, structure of, A., 994.  
 surface tension of, A., 690.  
 protective effect of gelatin on, A., 693.  
 influence of blood constituents on bactericidal power of, A., 546.  
 determination of, iodometrically, A., 922.  
 hair-, formation of, A., 460.  
 native, A., 595.  
 tarnish-resisting, production of, (P.), B., 472.  
 Silver alloys, production of, (P.), B., 191.  
 resistance of, A., 1082.  
 prevention of tarnishing of, (P.), B., 111.  
 production of tarnish-resistant coating on, (P.), B., 775.  
 tarnish-resistant, B., 845.  
 with aluminium, (P.), B., 896.  
 with antimony, arsenic, and bismuth, A., 116.  
 with antimony, cadmium, copper, and zinc, A., 455.  
 with beryllium, production of, (P.), B., 472.  
 with cadmium, electrolytic, A., 989.  
 with copper, A., 566, 989; (P.), B., 152\*.  
 structure of, A., 800.  
 inverse segregation in, A., 1082.

Silver alloys with copper and phosphorus, A., 1196.  
 for brazing, (P.), B., 684.  
 with copper and zinc, A., 687.  
 with gold, A., 800.  
 Hall effect in, A., 565.  
 Hall effect and lattice constant of, A., 12.  
 superconductivity of, A., 800.  
 with lead, magnetism and electrical resistance of, A., 1082.  
 with manganese, A., 470.  
 with palladium, crystal structure of, A., 221.  
 effect of adsorbed hydrogen on lattice constant of, A., 16.  
 with zinc, crystal structure of, A., 801.  
 Silver compounds, magnetic susceptibility of, A., 324.  
 bivalent, magnetism of, A., 10.  
 Silver salts, latent sensitivity of, in solution, A., 28.  
 periodic precipitation of, A., 1198.  
 hydrazinates of, A., 919.  
 Silver bromide, entropy of formation of, A., 812.  
 equilibrium of, with lead, and its chloride, and silver, A., 1205.  
 bromide and iodide, sulphur compounds retarding precipitation of, A., 918.  
 perchlorate, reaction of, with iodine, in organic media, A., 505.  
 chloride, solubility of, A., 457, 801.  
 thermodynamics of solid solutions of sodium chloride and, A., 700.  
 chromate, Liesegang rings of, in gelatin, A., 807.  
 influence of hydrolysed gelatin on precipitation of, A., 571.  
 ferrites, A., 481, 805, 1216.  
 fluoborate, A., 582.  
 halides, lattice energy and photochemical decomposition of, A., 479.  
 adsorption of organic compounds by, A., 332.  
 sols, stability of, A., 1087.  
 effect of temperature on coagulation of, A., 1087.  
 velocity of reduction of, A., 577.  
 determination of, in photographic printing paper, B., 1009.  
 periodate, preparation and crystal structure of, A., 450.  
 iodide, action of nuclei of, in emulsification, A., 479.  
 colloidal, preparation of, and its bactericidal value, B., 546.  
 nitrate, linear crystallisation velocity of cathode silver in electrolysis of, A., 236.  
 adsorption of, by finely-divided silver, A., 458.  
 effect of, on surface tension of aniline-water mixtures, A., 1200.  
 equilibrium of, with pyridine, A., 810.  
 action of oxides on, in light, A., 1097.  
 oxide, dissociation pressure of, A., 810.  
 effect of pressure on, A., 797.  
 adsorption of, by oxides and their compounds, A., 690.  
 selenate, crystal structure of, A., 12.  
 sulphate, crystal structure of, A., 12, 681.  
 solubilities and activity coefficients of, in salt solutions, A., 222.  
 thiosulphates, complex, A., 1216.  
 alkali thiosulphates, A., 1007.  
 sulphide, conductivity of, A., 446.  
 sulphides, thermal dissociation of, A., 573.

Silver organic compounds, therapeutic, manufacture of, (P.), B., 1137.  
 Silver detection and determination:—  
 detection of, catalytically, A., 711, 1222.  
 microchemically, A., 1222.  
 by adsorption, A., 35.  
 with dimethylaminobenzylidenerhodanine, A., 35.  
 determination of, colorimetrically, A., 826.  
 micro-electrolytically, A., 922.  
 indicator for, volumetrically, A., 825.  
 in anode sludge from electrolytic refining of copper, B., 310.  
 in presence of chlorides and copper, A., 1010.  
 volumetrically, in lead bullion, B., 265.  
 in photographic emulsions or images, B., 577.  
 in potassium silver cyanide, A., 922.  
 Silver electrodes. See under Electrodes.  
 Silver ions, activity coefficients of, A., 467.  
 in aqueous solutions of strong electrolytes, A., 572.  
 equivalent conductance of, A., 914.  
 reduction of, by ferrous ions, A., 1002.  
 Silver minerals of N.S.Wales, A., 248.  
 Silver ores, flotation of, (P.), B., 151.  
 containing lead, flotation concentration of, (P.), B., 1087.  
 of Lake Superior, A., 596.  
 Silver solder. See under Solder.  
 Sinactine, configuration of, A., 178.  
 Sinalbin as indicator, A., 586.  
 Sinomeneic acid, *l*-bromo-, and its salts, A., 628.  
 Sinomenic acid, and *l*-bromo-, and their salts, A., 628.  
 Sinomenic acid, *mono*- and *di*-bromo-, and their derivatives, A., 760.  
 Sinomenilone, *l*-bromo-, and its derivatives, A., 760.  
 Sinomenine, A., 628, 760, 1048, 1049.  
 Sinomeninone, and *l*-bromo-, acetolysis of, and *l*:5-*di*bromo-, hydrobromide, A., 1049.  
 dioxime, *l*-bromo-, Hofmann degradation of, A., 1048.  
 Sinomeninone, *l*:5:8-*tri*bromo-, hydrobromide, A., 760.  
 (—)Sinomeninone, bromo-, formation of, from dihydrothebainone, and its derivatives, A., 290.  
 Sinomeninonefurazan, *l*-bromo-, A., 1048.  
 Sinomenium, alkaloids of, A., 1048.  
 Sintering apparatus, (P.), B., 27, 660, 893, 942.  
 discharge grate for, (P.), B., 685.  
 performing endothermic reactions in, (P.), B., 820.  
 Greenawalt, B., 602.  
 Sintering machines, (P.), B., 729.  
 Siphons, safety, A., 138.  
 uniform delivery, (P.), B., 663.  
 Sisal, decortication of, (P.), B., 596.  
 $\gamma$ -Sitostanol, difference between *allo*-*a*-ergostanol and, A., 511.  
 Sitosterol, formula for, and its esters, A., 844.  
 Sitosteryl methyl ether, A., 737.  
 Size for textiles, B., 143.  
 rosin, manufacture of emulsions of (P.), B., 1091.  
 precipitates obtained by adding, to hard water, B., 1091.  
 Sizing of threads, etc., (P.), B., 226.  
 Skatole in sewage, B., 369.  
 Skeleton, human, composition of, A., 78.  
 Skin, preparations for treatment of, (P.), B., 322.

**Skin**, influence of light rays on cholesterol content of, A., 648.  
 action of hydrofluoric acid on, A., 1060.  
 absorption of iodine by, A., 775.  
 reduction of oxyhemoglobin in, A., 1270.  
 effect of fat administration on sebum of, A., 958.  
 effect of thiol groups on proliferation of, A., 87.  
 hyperplastic reaction of, to thiol groups, A., 641.  
 diastase in blood in diseases of, A., 297.  
 pigmentation of, in icterus, A., 1158.  
 test substance for allergy of, A., 417.  
 frog's, permeability of, A., 877.  
 human, A., 870.  
   osmosis of water and gases through, A., 1162.  
 nitroprusside reaction for, A., 1055.  
 detection in, of formic acid, A., 1154.  
**Skins**, photomicrographs of, B., 439.  
 treatment of, (P.), B., 121.  
   before tanning, (P.), B., 951.  
   for production of felted fibres, (P.), B., 811.  
 bating of, B., 904.  
   theory of, B., 393.  
 deliming and bating of, B., 393.  
 depilation of, by "sweating," B., 393, 904.  
 drenching of, (P.), B., 742.  
 pickling of, B., 564.  
 action of pickling solutions on, B., 810.  
 tanning of, (P.), B., 616, 951, 1001.  
   in stationary vessels, (P.), B., 439.  
   for belting, etc., (P.), B., 238.  
 oil tanning of, (P.), B., 1002.  
 machines for working of, (P.), B., 652.  
 apparatus for determination of plumpness and flaccidity of, B., 72.  
 chemistry of, B., 316.  
 chemistry of integument of, B., 904.  
 "lime blast" on, B., 740.  
 action of yeast extracts on constituents of, B., 616.  
 preservatives for, B., 1045.  
 animal, X-ray studies on, B., 273.  
   preparation of, for tanning, (P.), B., 565.  
 fur, tanning of, (P.), B., 1094.  
 hairy, treatment of, (P.), B., 35.  
 Indian, "salt stains" on, B., 35.  
 South Indian, salt stains on, B., 564.  
 rabbit, preparation of, for use in clothing, (P.), B., 35.  
 raw, unhairing and bating of, (P.), B., 439.  
   salting of, B., 393, 810.  
   salt stains on, B., 690.  
   "salzstippen" on, due to microspores, B., 740.  
   snake. See Snake skins.  
**Skin powders**, (P.), B., 1008.  
**Sky**, night, spectrum of, A., 105, 979.  
   auroral green light in, A., 104, 668.  
   red radiation from oxygen in, A., 207, 441, 552.  
   in tropics, non-polar auroral light from, A., 441.  
**Slag**, production of porous masses from, (P.), B., 628.  
 containing lead, removal of zinc from, B., 230.  
 containing manganese, B., 230.  
 basic, percolation of, on soils, B., 1045.  
 highly-soluble, production of, (P.), B., 1037.  
 open-hearth, iron content of, B., 773.  
 soluble, production of, (P.), B., 943.

**Slag**, blast-furnace, treatment of, (P.), B., 470, 984.  
   theory of silicate residues of, B., 643.  
   pressure elasticity of, B., 937.  
   use of, in agriculture, B., 478.  
   building materials from, B., 1120.  
   use of, in paving-blocks, B., 308.  
   manufacture of glass from, B., 181.  
 furnace, treatment of, (P.), B., 110.  
 fused, handling of, (P.), B., 1.  
 treatment of, (P.), B., 110.  
 metallurgical, corrosive action and constitution of, B., 105.  
 phosphatic, determination of fluorine in, B., 62.  
 refractory, testing of, B., 1080.  
 Thomas, addition of sand to, B., 551.  
**Slate**, physical properties and weathering of, B., 1081.  
   durability of, for roofing, B., 772.  
**Slate powder**, use of, in paint and allied industries, B., 270.  
 Slits of fixed width, construction of, A., 1105.  
**Sloebery wine**. See under Wines.  
**Sludge**, apparatus for removal of, from liquids, (P.), B., 86.  
   activated, collection of gas from digestion of, at Rockville Centre, N.Y., B., 210.  
   activated and primary, digestion of, at Salinas, Calif., B., 209.  
   of Connecticut river, biochemical oxygen demand and volatile solids in, B., 706.  
   See also Sewage sludge.  
**Slugs**, ecology and control of, B., 124.  
 Slurry, aeration of, (P.), B., 788.  
 Smear-case, desiccation of, (P.), B., 912.  
**Smectite**. See Montmorillonite.  
**Smelting apparatus**, (P.), B., 787.  
**Smoke**, measurement of, B., 403.  
   electrical apparatus for measuring intensity of, (P.), B., 685.  
   abatement of, in industry, B., 531.  
   removal of, from gases, (P.), B., 667.  
   respirator filters for, (P.), B., 486.  
   washing apparatus for, (P.), B., 5.  
   in relation to fuels, B., 824.  
   fibrous filling for gas-mask containers for protection against, (P.), B., 823.  
   irritant, composition for, (P.), B., 104.  
   stearic acid, A., 805.  
   electrical apparatus for detection of, (P.), B., 353.  
**Smut**, "stinking," control of, B., 124.  
**Snails**, oxidation-reduction potential in, A., 298.  
   glucosulphatase from, A., 92.  
**Snake skins**, tanning of, B., 238.  
**Snow at Mount Vernon, Iowa**, A., 926.  
**Soap or Soaps**, B., 196.  
   preparation of, in relation to analytical results, B., 516.  
   manufacture of, B., 806; (P.), B., 435, 612, 778, 899, 946, 995, 1039.  
   from per-salts, (P.), B., 1090.  
   evaluation of crude fats for, B., 152.  
   separation of hydroxy-acids from hydrocarbon oxidation products in, B., 1065.  
   extraction of, with benzene, B., 993.  
   refining of base for, (P.), B., 1039.  
   boiling of, B., 28, 434, 516.  
   lathering power of, B., 560.  
   consumption of, in relation to hardness of water, B., 754.  
   hardness tests on, B., 69.  
   preservation of, (P.), B., 1090.  
   stabilisation of, (P.), B., 516, 1039.  
   anti-oxidants for, (P.), B., 378, 460.  
   use of, in dry-cleaning, B., 797.

**Soap or Soaps**, scouring action of, on silk, B., 1116.  
   measurement of detergent action of, B., 418.  
   effect of, on electric moment at aqueous cellulose interfaces, A., 804.  
   gelatinisation of, with cresols, A., 911.  
   soluble compounds of, with cholesterol, A., 1127.  
   manufacture of preparations of, (P.), B., 152.  
   flakes, manufacture of, (P.), B., 649.  
   of higher unsaturated fatty acids, influence of antioxidants on, B., 193.  
   aluminium, tribasic, probable non-existence of, A., 1112.  
   bleached, manufacture of, (P.), B., 391.  
   bleached with hypochlorous acid, removal of odour from, (P.), B., 612.  
   buoyant, production of, (P.), B., 270.  
   calcium, absorption of, in white rats, A., 423.  
   loaded with clays, determination in, of fatty acids, B., 993.  
   cresol, evaluation of, B., 516.  
   dry-cleaning, auxiliary solvents for, B., 1125.  
   aqueous, B., 434.  
   ethanolamine, B., 193.  
   germicidal, (P.), B., 899.  
   hard, production of, (P.), B., 995.  
   use of vegetable oils in, B., 735.  
   Japanese, hygroscopic equilibria in, B., 403.  
   lead, production of, (P.), B., 777.  
   liquid, sampling and analysis of, B., 1125.  
   milled, manufacture of, (P.), B., 313.  
   floatable cakes of, (P.), B., 649.  
   titre and fatty acid content of, B., 29.  
   neutral and acid, B., 735.  
   potash, determination in, of free caustic alkali, B., 993.  
   potash-fish-oil, analysis of, B., 269.  
   powdered, manufacture of, (P.), B., 233, 995.  
   resinous, manufacture of, (P.), B., 116.  
   scented, catalytic action of perfumes in deterioration of, B., 777.  
   shaving, (P.), B., 313, 612.  
   manufacture of, B., 561.  
   with mentholated core, (P.), B., 313.  
   sodium, preparation and biochemical oxygen demand of, B., 559.  
   sodium silicate, analysis of, B., 269.  
   soft, production of, (P.), B., 995.  
   sulphur, (P.), B., 517.  
   toilet, preparation of, B., 390.  
   manufacture of, B., 647.  
   soap base for, B., 777.  
   prevention of rancidity and spotting in, B., 312.  
   perfuming of, (P.), B., 435.  
   detection in, of colophony and abietic acid, B., 71.  
   determination in, of free caustic alkali, B., 777.  
   of unsaponified matter, B., 29.  
**Soap solutions**, structure of, B., 849.  
   surface tension of, A., 333.  
   solvent properties of, A., 687, 802, 1205.  
   effect of alkali salts on detergency of, B., 1118.  
   alcoholic, extraction of unsaponifiable matter and unsaponified fat from, B., 69.  
   Boys', effect of light on surface tension of, A., 224.  
**Soap stock**, analysis of, B., 312.  
**Soda**. See Sodium carbonate.  
 caustic. See Sodium hydroxide.

**Soda-pulp**, treatment of black liquor from, (P.), B., 641.  
 action of caustic solutions on, B., 141.  
**Sodalite** from Bolivia, A., 1106.  
**Sodio-cellulose**. See under Cellulose.  
**Sodium**, atomic mass of, A., 922.  
 atoms, transition probabilities and quenching in, A., 1.  
 production of, in the Castner cell, B., 432.  
 Zeeman effect in spectrum of, A., 103.  
 intensity in forbidden series in spectrum of, A., 667.  
 arc spectrum of, A., 103.  
 transitions in flame spectrum of, A., 979.  
 magnetic rotation spectrum of, A., 667.  
 spark spectrum of, A., 787.  
 ultra-violet spectrum of, A., 667, 1071.  
 yellow-red band spectrum of, A., 667.  
 oscillator density for D-lines of, A., 103.  
 resonance radiation of, A., 1183.  
   effect of inert gases on, A., 439.  
 D-line fluorescence of, A., 103.  
 heat of dissociation of, A., 667.  
 vapour, scattering of light in, A., 2.  
   excitation probability of, A., 439.  
 vapour pressure of, A., 1195.  
 density of solutions of, in liquid ammonia, A., 1200.  
 burner for, A., 1106.  
 luminosity of flames containing, A., 551.  
 highly attenuated flames of, A., 680.  
 condensations with, A., 157, 728.  
 precision cutter for, A., 246.  
 production of moulded articles from, (P.), B., 896.  
**Sodium alloys** with lead, reductions with, A., 49.  
   with mercury, velocity of solution of, A., 1003.  
   liquid, A., 1196.  
   viscosity of, A., 800.  
   with potassium, liquid, viscosity of, A., 800.  
   with thallium, structure of, A., 455.  
**Sodium salts**, separation of, (P.), B., 885.  
   potential measurements with buffer solutions containing, A., 813.  
**Sodium aluminate**, manufacture of, (P.), B., 1119.  
   as an electrolyte for casting-slip control, B., 888.  
   borate (*borax*), production of, from brines, (P.), B., 464.  
   purification of, (P.), B., 305.  
   perborate, influence of magnesium and copper on decomposition of solutions of, B., 504.  
   borates, equilibrium of formation of, A., 341.  
   bromate, magnetic birefringence in solutions of, A., 1190.  
   bromide, production of, (P.), B., 1078.  
   heat of dilution and heat content of solutions of, A., 998.  
   density of solutions of, in liquid ammonia, A., 1200.  
   hydration equilibria of, A., 469.  
   carbonate, production of, (P.), B., 340, 678.  
   by ammonia-soda process, B., 100, 179, 769.  
   by the Gesellschaft für Kohlentechnik, B., 419.  
   by the Solvay process, B., 258.  
   purification of brine for, B., 101.  
   from the carbamate and chloride, B., 1027.  
   from salt and coal, (P.), B., 934.  
   and ammonium chloride, (P.), B., 181.  
   and ammonium sulphate, B., 100.

**Sodium carbonate**, heat of solution of, A., 812.  
   and specific heats of its solutions, A., 23.  
   specific gravity of, as a measure of its suitability for use in glass, B., 641.  
   solubility of, in water, A., 457.  
   in aqueous solutions of ammonia, A., 687.  
   crystals, chemical control of manufacture of, B., 100.  
   cauticisation of, B., 798.  
   with lime, B., 419.  
   reaction of, with chlorine, A., 349.  
   anhydrous, analysis of, B., 723.  
   decahydrate, transition temperature of, A., 997.  
   hydrogen carbonate, manufacture of, (P.), B., 21, 1119.  
   and sodium sulphate decahydrate, (P.), B., 885.  
   purification of, B., 419.  
   calcination of, B., 258.  
   decomposition of, in aqueous solution, A., 238.  
   chlorate, production of, in electrolysis of sodium chloride, B., 101.  
   magnetic birefringence in solutions of, A., 1190.  
   danger of explosion of, from mechanical shocks, A., 131.  
   chloride, production of, B., 419.  
   from brine, B., 259.  
   as a by-product in petroleum refineries, B., 597.  
   spectrum of, A., 6.  
   Raman spectrum of, A., 1189.  
   electrolysis of, B., 101, 419.  
   electrolytic cell for, (P.), B., 992.  
   conductivity of, in sucrose solution, A., 1206.  
   transference numbers of aqueous solutions of, A., 914.  
   transference of water in electrolysis of solutions of, A., 1092.  
   heat of dilution and molal heat contents of solutions of, A., 698.  
   vapour pressure of saturated solutions of, A., 22.  
   fused, viscosity of, A., 1080.  
   cryoscopy of mixtures of salts with, A., 570.  
   diffusion of, in aqueous solutions, A., 990.  
   solubility of, in ammonia, B., 1027.  
   heat contents of constituents of solutions of, A., 998.  
   influence of magnesium salts on solubilities of mixtures of potassium chloride and, A., 568.  
   crystals, effect of impurities on, A., 1193.  
   growth of, A., 681.  
   reflexion of thallium, lead, and antimony atoms from, A., 1185.  
   needle-shaped crystals of, A., 797.  
   equilibrium of, with magnesium and potassium chlorides, A., 1205; B., 259.  
   with potassium chloride and water, A., 339, 1091.  
   with sodium oleate and water, A., 1205.  
   thermodynamics of aqueous solutions of, A., 467.  
   thermodynamics of solid solutions of silver chloride and, A., 700.  
   bacteriology of, B., 784, 861.  
   dihydrate, polythermic field of crystallisation of, A., 22.

**Sodium chloride**, titration of, argentometrically, A., 922.  
   determination in, of sodium nitrate, B., 597.  
   chloride and sulphate, vapour pressure of saturated aqueous solutions of, A., 339.  
   potassium cobaltinitrite, determination of, A., 922.  
   fluoride, manufacture of, (P.), B., 102.  
   scattering of X-rays by, A., 979.  
   fluoride and *metasilicate*, thermal analysis of mixtures of, A., 340.  
   tetragermanate, A., 584.  
   hydrogen germanate, conductivity and hydrolysis of, A., 998.  
   hydride, hydrogenation catalysis with, A., 819.  
   hydroxide, production of, (P.), B., 505.  
   theory of Löwig's process for, B., 100.  
   by the silicofluoride process, B., 722.  
   from salt and coal, (P.), B., 934.  
   in soda liquors from pulp liquors, B., 179.  
   recovery of, from refining of oils, B., 969.  
   from waste liquors from digestion of Chinese reeds, B., 304.  
   plants for, B., 677.  
   removal of chloride from, (P.), B., 340.  
   fused, anhydrous, production of, (P.), B., 505.  
   production of concentrated solutions of, (P.), B., 227.  
   Raman spectrum of aqueous solutions of, A., 675.  
   solubility of barium hydroxide in solutions of, A., 1198.  
   interfacial tension between benzene solution of palmitic acid and solutions of, A., 1200.  
   velocity of absorption of carbon dioxide by, A., 577.  
   thermodynamics of, A., 573.  
   reduction of, A., 29.  
   reaction between carbon disulphide and, B., 16.  
   use of, in analysis, A., 587.  
   carbonate content of standard solutions of, A., 588.  
   determination of, with the immersion refractometer, A., 1009.  
   hypochlorite, solidification of solutions of, (P.), B., 599.  
   effect of alkalis on available chlorine and germicidal effect of, B., 78.  
   hyposulphite, preparation of, from sodium and sulphur dioxide, B., 144.  
   electrochemical production of, B., 840.  
   use of, in analysis, A., 712.  
   iodate, equilibria of, with calcium, magnesium, and potassium iodates and water, A., 341.  
   iodide, analysis of, A., 711.  
   iodoazide, reaction of, with ultramarine, A., 29.  
   iodobismuthite for treatment of syphilis, A., 1058.  
   nitrate, manufacture of, (P.), B., 340.  
   molecular rotation of, A., 445.  
   f.p. of solutions of, A., 912.  
   fused, refractive index of, A., 111.  
   conductivity and polarisation in crystals of, A., 676.  
   equilibrium of, with lead nitrate, A., 468.  
   with lead and potassium nitrates, A., 1205.  
   determination of, optically, A., 1010.  
   in pickling and preserving salt, B., 597.

Sodium nitrite, fusion curve of, and potassium nitrite, A., 809, 810.  
 conversion of, into nitrate, A., 823.  
 reaction of, with hydroxylamine sulphate, A., 815.  
 oxide, equilibrium of, with aluminium and calcium oxides, A., 574.  
 peroxide, thermal dissociation of, A., 228.  
 phosphate, production of, (P.), B., 505.  
 use of, in boilers, B., 963.  
 compositions containing, for water softening, B., 707.  
 phosphates, production of mixtures of, for treatment of boiler waters, (P.), B., 934.  
 metaphosphate, fused, electrolysis of, A., 705.  
 metaphosphates, acidity of solutions of, A., 696.  
 monohydrogen phosphate, production of, (P.), B., 724.  
 pyrophosphate, and its equilibrium with the orthophosphate, A., 582.  
 adsorption of, by charcoal, A., 803.  
 swelling and diffusion of, in gelatin, A., 694.  
 selenites, A., 584.  
 silicate, purification of solutions of, (P.), B., 885.  
 as a detergent, B., 312.  
 persilicate, A., 350.  
 sulphate, continuous furnace for manufacture of, B., 61.  
 removal of iron in manufacture of, B., 339.  
 in gypsum layer of potash salt-beds, A., 714.  
 heat of dilution of, A., 23.  
 fused, refractories resistant to, B., 726.  
 oxidation of, by oxygen, in presence of fatty acids, A., 577.  
 equilibrium of, with aluminium sulphate, and water, A., 341.  
 pyrogenic decomposition of, B., 597.  
 anhydrous, crystal structure of, A., 218.  
 decahydrate, production of sodium bicarbonate and, from mixtures of carbonate and sulphate, (P.), B., 885.  
 sulphates, equilibria of, A., 573.  
 aluminium sulphate, A., 997.  
 potassium sulphate, production of, (P.), B., 464.  
 praseodymium sulphates, A., 132.  
 sulphide, partial dehydration of, (P.), B., 1078.  
 oxidation of dilute solutions of, in air, B., 545.  
 sulphide and hydrogen sulphide, oxidation of, A., 576.  
 sulphite, rate of absorption of oxygen by solutions of, A., 26.  
 induced oxidation with, A., 703.  
 ozonolysis of, A., 1212.  
 hydrogen sulphite (*bisulphite*), preparation of, B., 61.  
 effect of, on surface tension of acetone-water mixtures, A., 1200.  
 thiosulphate, manufacture of, (P.), B., 305.  
 recovery of, from gas liquor, etc., (P.), B., 1078.  
 latent and specific heats of, A., 1081.  
 solid, standardisation of *N*-hydrochloric acid with, A., 921.  
 electrolytic oxidation of, at platinum anodes, A., 1096.  
 preservation and determination of, A., 921.  
 silver thiosulphates, A., 1216.  
 tungstate, ionic transformation in solutions of, A., 1204.

Sodium organic compounds:—  
 Sodium azide, reaction of, with acid chlorides, A., 1118.  
 cyanamide, manufacture of, B., 1027.  
 Sodiumoxyethoxymethylene, A., 143.  
 Sodium determination:—  
 determination of, A., 825.  
 removal of phosphates for, A., 243, 786.  
 oxidimetrically, A., 136.  
 volumetrically, A., 588.  
 with magnesium uranyl acetate, A., 488.  
 as sodium uranyl zinc acetate, A., 711.  
 in aluminium, B., 844, 892.  
 in biological material, A., 102, 978.  
 in blood-serum, volumetrically, A., 1152.  
 in organic compounds, A., 314.  
 in soils, B., 855.  
 Sodium ions, equivalent conductance of, A., 914.  
 Soils, structure of, B., 521, 652, 1095.  
 rôle of absorbed air in, and its determination, B., 1095.  
 stability of, and effect of rain and irrigation, B., 854.  
 loam structure and synthesis of aggregates in, B., 691.  
 determination of nature of, (P.), B., 908.  
 classification of, A., 1230.  
 age and evolution of, A., 1108.  
 characterisation of, B., 854.  
 from their moisture equivalent, B., 690.  
 determination of surfaces of, by adsorption of carbon dioxide, B., 906.  
 determination of total surface area of, B., 743, 811, 1095.  
 ultrafilter for, B., 477.  
 measurement of heaviness of, B., 275.  
 effect of dispersion on weight of, B., 905.  
 seedling and chemical methods of examination of, B., 275.  
 determination of consistency of, by a field method, B., 854.  
 degree of weathering of, B., 521.  
 effect of fine materials in, on their physical characteristics, B., 274.  
 single value constants of, B., 274.  
 radioactivity and fertility in, B., 36.  
 electrical capacity and conductivity of, A., 249.  
 electrical conductivity of aqueous suspensions of, and its relation to fertility, B., 276.  
 determination of ion-exchange capacity of, B., 1129.  
 electrodialysis of, B., 692, 1094.  
 apparatus for, B., 276.  
 electrodialysable bases in, B., 692.  
 ions capable of electrodialysis from, B., 477.  
 freezing of, with carbon dioxide, (P.), B., 745.  
 aggregating action of frost on, B., 477.  
 changes in, produced by high temperatures, B., 274.  
 adsorption in, B., 477.  
 influence of the anion on, of bases, B., 1095.  
 of gases, in relation to their surface, B., 1002.  
 of ions, B., 1095.  
 of magnesium, B., 743.  
 of water, B., 811.  
 adsorptive capacity of, B., 35, 743.  
 adsorptive capacity of mineral and organic fractions of, B., 905.  
 absorption complex in, B., 35, 1045.  
 separation of mineral from organic constituents of, B., 36.

Soils, influence of cations adsorbed by, on their elutriation properties, B., 1094.  
 dispersion of, for hydrometer method of analysis, B., 275.  
 effect of climatic variations on plasticity of, B., 854.  
 capillary rise of salt solutions through, B., 781.  
 capillary rise of water through, B., 198.  
 permeability of, B., 690.  
 to gases at high temperatures, B., 361.  
 to water, effect of gelatin sol on, B., 36.  
 effect of replaceable sodium on, B., 198.  
 permeability and irrigation of, B., 565.  
 determination of porosity of, B., 691.  
 water percolation in, B., 652, 780, 952.  
 determination of hygroscopicity and water capacity of, B., 854.  
 relationship between hygroscopicity, adsorbed bases, and physical properties of, B., 1128.  
 degree of saturation of, B., 199.  
 relationships between degree of saturation and buffering of, and its reaction, B., 811, 854, 1129.  
 determination of state of saturation and  $p_H$  of, by interaction with ammonia, B., 692.  
 moisture equivalent of, B., 274.  
 relation of  $p_H$  drift to moisture content and base held in, B., 199.  
 cohesion forces of, B., 905.  
 solubility of, in relation to their composition, B., 36.  
 solubility of solid phase of, in water, B., 1045.  
 catalytic power of, B., 905.  
 measurement of colour of, B., 477.  
 classification of colours of, A., 1108.  
 dependence of colour of, on iron and humus content, B., 1127.  
 decolorisation of aqueous extracts of, B., 82.  
 influence of hydrogen peroxide on, B., 691.  
 fertiliser requirements of, B., 276, 693, 744.  
 by testing of maize stems, B., 568.  
 by Mitscherlich's method, B., 744.  
 effect of composts on application of fertilisers to, B., 694.  
 effect of fertilisers on ammonification in, B., 694.  
 action of fertilisers on reaction of, and on crop yields, B., 1129.  
 influence of inorganic fertilisers on, B., 38.  
 response of applications of calcium arsenate to, B., 906.  
 effects of farmyard manure and fertilisers on, B., 782.  
 use of iron blast-furnace slags on, B., 478.  
 liming materials for, B., 395.  
 effectiveness of limestone particles in, B., 440.  
 effect of peat on, B., 743.  
 use of peat in composts for, B., 744.  
 effect of potash fertilisers on root-solubility of phosphates in, B., 694.  
 use of superphosphate and basic slag on, B., 812.  
 effect of thallium salts on fertility of, A., 550.  
 effect of tillage on, B., 569.  
 effect of tillage on carbon and nitrogen in, B., 522.  
 influence of tractor work on physical properties of, B., 691.



Soils, influence of tractors and other agricultural implements on physical and biochemical processes in, B., 691.  
 reaction of, B., 37, 1095.  
 relation between, and type, B., 36.  
 effect of ammonium sulphate on, B., 477.  
 influence of lime and potash fertilisers on, B., 907.  
 effect of lime, superphosphate, and potash on, B., 440.  
 influence of superphosphate and ammonium superphosphate on, B., 1046.  
 in relation to plant growth, B., 38.  
 amphoteric reactions and isoelectric weathering in, B., 1045.  
 acidity of, B., 73.  
 determination of, by modified Hutchinson-MacLennan method, B., 1128.  
 correction of, B., 693.  
 periodic variations in, B., 1095.  
 influence of plants on seasonal variation of, B., 38.  
 growth of plants in relation to, B., 1097.  
 effect of treatment with hydrochloric acid on, B., 73.  
 effect of nitrogenous fertilisers on, B., 158, 477.  
 influence of sulphur oxidation on, B., 693.  
 mineral acidity of, B., 361.  
 physiological effect of, to plants, B., 856.  
 nature of water-soluble acidity of, and its effect on root growth, B., 782.  
 buffer action of, B., 122.  
 relations of buffer capacity for acids of, to basicity and exchangeable bases, B., 693.  
 electrical neutralisation of, by methylene blue, and their adsorption capacity, B., 811.  
 soluble aluminium in, B., 952.  
 aluminium cycle and exchange acidity in, B., 1128.  
 fixation, nitrification, and leaching of ammonium sulphate in, B., 617.  
 investigation of base exchange in, with the quinhydrone electrode, B., 361.  
 significance of base-exchange in, B., 35.  
 organic base-exchange materials in, B., 693.  
 effect of degree of dispersion and exchangeable bases on quality of, B., 394.  
 dehydration, acidity, and exchangeable bases of, B., 361.  
 formation of calcium acetate gels in, B., 477.  
 effect of liming on exchangeable calcium and magnesium in, B., 692.  
 carbon and nitrogen cycles in, B., 275, 692, 854.  
 decomposition of cellulose in, B., 692.  
 significance of acidity in decomposition of chalk and phosphorites in, B., 1128.  
 effect of coal in, B., 567.  
 cataphoretic separation of colloidal fraction of, B., 742.  
 colloids in, B., 565, 1045.  
 in relation to their classification, B., 652.  
 behaviour of, B., 73, 274.  
 fractionation, composition, and constitution of, B., 1002.  
 base-exchange reactions of, A., 459.  
 mineral constituents of, B., 905.  
 influence of electrolytes on organic colloids in, B., 1095.  
 humic acid in, B., 275.

Soils, origin of humic matter in, B., 692.  
 iron in, in relation to bush sickness, A., 959.  
 replaceable iron and aluminium in, B., 198.  
 relation between particle size and decomposition of limestone in, B., 1128.  
 behaviour of magnesium in, B., 855.  
 water-soluble magnesium in, B., 1002.  
 formation of mull and duff in, B., 1046.  
 availability of manganese in, B., 37.  
 nitrates in, B., 199, 692.  
 effect of plants on distribution of, B., 74.  
 assimilation of nitrates by, B., 37.  
 reduction of nitrates in, by *Azotobacter*, B., 692.  
 effects of single and fractional applications of soluble nitrogen on nitrates in plants and, B., 522.  
 nitrification in, B., 907.  
 in autumn and winter, B., 907.  
 nitrification and nitrogen fixation and microbiological tests for fertility of, B., 1128.  
 distribution of denitrifiers at various depths of, B., 200.  
 nitrogen in, B., 274.  
 effect of black locust tree on, B., 618.  
 nitrogen fixation in, by algae, B., 1128.  
 by *Azotobacter*, B., 477.  
 influence of calcium on, B., 1128.  
 effect of manures on, B., 1002.  
 periodism of, and influence of inoculation with *Azotobacter*, B., 906.  
 effect of manures and crop residues on nitrogen changes and micro-organisms in, B., 38.  
 extraction of organic nitrogen from, with alkali, B., 692.  
 reserve nitrogen in, after cropping with sugar beet, B., 362.  
 mineralisation of nitrogen compounds in, B., 1096.  
 mobility of nitrogen compounds in, B., 1045.  
 biochemical transformation of nitrogen and phosphorus in, B., 394.  
 organic matter in, B., 521.  
 in relation to type, B., 951.  
 effect of, on physical properties, B., 1047.  
 in dry farming regions, B., 692.  
 effect of hydrogen peroxide on, B., 37.  
 influence of  $p_H$  on decomposition of organic matter in, by hydrogen peroxide, B., 274.  
 decomposition of pentosans in, B., 692.  
 phosphates in, B., 1002.  
 solubility of, B., 617, 781.  
 leaching of, by superphosphate and basic slag, B., 1045.  
 phosphate composts with, B., 694.  
 effect of deficiency of phosphate fertilisers on, B., 744.  
 determination of phosphate requirement of, B., 653.  
 mineral phosphates in, B., 742.  
 utilisation of pyrites in mixtures of raw phosphates by, B., 523.  
 fixation of phosphoric acid in, B., 123, 1046.  
 effect of carbon dioxide and lime on solubility of phosphoric acid of, B., 36.  
 distribution of phosphoric acid in mechanical fractions of, B., 1095.  
 phosphoric acid deficiency in, B., 952.  
 influence of adsorbed cations on utilisation of phosphorus in, by plants, B., 523.

Soils, relation of assimilable phosphorus in, to lime content, B., 199.  
 determination of phosphorus requirement of, by *Aspergillus niger*, B., 743.  
 relations between reaction and root-soluble potash content of, B., 693.  
 solubility of potassium of, B., 122.  
 mobility of potassium in, B., 1096.  
 assimilable potassium and phosphorus in, as shown by Neubauer-Schneider test, B., 690.  
 replaceable and water-soluble potassium in, B., 694.  
 fixation of protein by, A., 437.  
 cyclic salt changes in, B., 652.  
 neutral salt extracts of, B., 361.  
 behaviour of sodium and potassium in, B., 905.  
 origin of circulating sulphate solutions in, A., 926.  
 effect of sulphur on, B., 440, 567.  
 sulphur cycle in, A., 39.  
 sulphur oxidation in, B., 521.  
 formation of polythionates from sulphur in, B., 1128.  
 transformation of urea in, B., 695, 1128.  
 forms and functions of water in, B., 565.  
 available water in, and wilting of plants, B., 440.  
*Azotobacter* test for deficiency of, B., 907.  
 "sickness" of, B., 275.  
 anaërobic and swamp conditions of, B., 742.  
 podsol formation in, B., 477.  
 solonetz formation in amelioration of, B., 780.  
 coverings for, B., 953.  
 covering of, with cardboard and sawdust instead of double ploughing, B., 695.  
 effect of paper mulches on temperature and moisture of, and on yield of crops therefrom, B., 317.  
 influence of methods of irrigation on nutrients in, B., 522.  
 correlation of types of, with pipe-line corrosion, B., 73.  
 from erosion experiment stations, characteristics of, A., 1108.  
 for irrigation engineering works, B., 952.  
 respiration of, B., 521, 952.  
 productive power of, B., 1045.  
 significance of vegetation factors in productivity of, B., 395.  
 effect of nutrient content and reaction of, on growth of plants, B., 362.  
 nutrient content of, in relation to soil maps, B., 36.  
 exchangeable cations of plants and, B., 692.  
 effect of clover culture on, A., 549.  
 degradation of, by oaks, A., 1230.  
 microbiology of, A., 437, 545; B., 692.  
 action of fertilisers on micro-organisms in, B., 1129.  
 influence of development of higher plants on micro-organisms in, B., 74.  
 effects of sorghum plants on biological activities in, B., 200.  
 bacterial activity in, B., 275.  
 culture of anaërobic bacteria in, by modified Morse-Kopeloff method, B., 692.  
 association of micro-organisms and roots in, B., 907.  
 action of ammonium sulphate on organisms in, B., 276.  
 influence of lime on growth of *Aspergillus* in determination of potash requirement of, B., 566.  
 sterilisation of, electrically, (P.), B., 1003.

Soils, acetic acid, pyroligneous acid, and formaldehyde as disinfectants for, B., 696.  
 testing of, with the pachimeter, B., 867.  
 Soils, acid, manuring of, B., 569.  
   calcium treatment of, B., 521.  
   buffer capacity of, B., 693.  
   iron toxicity from liming of, B., 856.  
   light, influence of fertilisers and lime on replaceable bases in, B., 37.  
   mineral, action of superphosphate on, B., 617.  
 Alberta, phosphorus in, B., 361.  
 alkali, reclamation of, in Hungary, B., 617.  
   physico-chemical changes in, B., 951.  
 arable, formation of, from loess of Dutch Limburg, A., 39.  
   mineral sulphides in, B., 811.  
   nitrification of stall manure in, B., 317.  
   determination of oxidising power of, B., 441.  
 Arizona, determination of fertiliser requirements of, by *Azotobacter* method, B., 952.  
 Australian, A., 39.  
 in Austrian Schneeberge, protozoa in, A., 1108.  
 auto-irrigated, moisture and plant growth in, B., 565.  
 brown steppe, in the Thessalian plain, A., 249.  
 cacao, carbon-nitrogen ratio in, B., 361.  
 calcareous, of Champagne, absorption and mobilisation of potassium in, B., 617.  
 containing calcium carbonate, determination in, of exchangeable calcium and magnesium, B., 692.  
 carbonate, analysis of, B., 1094.  
   determination of adsorbed bases in, B., 35.  
 chernozem, dynamics of, B., 1095.  
   variations in dispersion of, B., 1095.  
   influence of lime on fertility of, B., 694.  
   denitrification in, B., 200.  
   phosphorus in, B., 742.  
   of Azov, relation between moisture content and crop yields from, B., 565.  
 chernozem and solonetz, stability of base exchange capacity in, B., 35.  
 adjoining coke ovens, lead in, and poisoning of stock thereby, B., 743.  
 Colorado, fungi in, B., 361.  
 Connecticut, manganese in, and its relation to growth of tobacco, B., 522.  
 cultivated, physical chemistry of, B., 121.  
   carbon-nitrogen ratio in humus layers of, B., 1046.  
   annual changes in  $p_H$  of, B., 1095.  
   relation between nitrogen and humus in, B., 317.  
 decalcified, rôle of aluminium in, B., 440.  
 deciduous orchard, Californian, distribution of potassium in, B., 855.  
 deficient in lime, rôle of aluminium in, B., 123.  
 desert, non-symbiotic fixation of nitrogen in, B., 1128.  
 of drainage plots at Cockle Park, reactions of, B., 36.  
 dry, fertiliser requirements of, B., 318.  
 fertile, biochemistry of, A., 437.  
 field, phosphate penetration in, B., 440.  
 "sticky point" determinations of moisture in, B., 36.

Soils, forest, classification of, A., 1230.  
   significance of lime for, B., 74.  
   of Mont Alto state forest, A., 40.  
   of the N.W. United States, B., 906.  
   determination of acidity of, B., 906.  
 grassland, removal of added nitrogen from, B., 855.  
 greenhouse, effect of reaction of, on growth of plants, B., 158.  
   influence of naphthalene on bacteria and protozoa in, B., 37.  
   containing sodium-clay, reclamation of, B., 653.  
 Hawaiian, physical properties of, B., 394.  
   pineapple, manganese-dioxide free, determination of replaceable hydrogen in, B., 394.  
 humus, determination in, of ferrous oxide, B., 1046.  
 Hungarian, alkaline, A., 1230.  
 igneous rock, of British Guiana, A., 39.  
 Indian, influence of alkali salts on nitrification in, B., 317.  
 Iowa, effects of lime on, B., 616.  
   nitrogen fixation in, B., 40.  
 Italian radioactive, effect of, on growth of plants and seeds, A., 661.  
 Kentucky, phosphates in, B., 855.  
 laterite, A., 927.  
   radioactive, in Japan, A., 1015.  
   red and yellow, of Brazil, A., 716.  
 Latvian, occurrence and properties of manganese in, B., 691.  
 from Lena delta, microflora of, A., 1108.  
 lowland, effect of temperature on exchange acidity of, B., 566.  
 of Mairao district, King-country, New Zealand, lime in, B., 521.  
 marsh, effect of "blue sand" on, B., 121.  
   of Southern Louisiana, spontaneous ignition of, A., 594.  
 mineral, fertilisers for, B., 238.  
 of Minnesota, effect of lime on replaceable bases in, B., 566.  
 moor, effect of drying on physico-chemical properties of, B., 653.  
   examination of, by the seedling method, B., 1127.  
 low-moor, mineralisation of humus nitrogen in, under grass, B., 440.  
   utilisation of superphosphate in, B., 317.  
 muck, nitrogen relationships in, B., 275.  
 of the Nile and Gash, A., 249, 597; B., 476.  
 normal and sour, influence of iron and manganese on catalytic activity of, B., 275.  
 pasture, available nitrogen in, B., 317.  
 peat, classification of, A., 360.  
   of Travancore, A., 39.  
   of New York, relation between organic matter and organic carbon in, B., 906.  
 podsol, composition of, A., 1108.  
   oxidation-reduction potentials in, B., 394.  
   effect of liming on structure of, B., 440.  
   effect of liming on fertility of, B., 694.  
   nitrification in, B., 200.  
   of sea dunes of Wollin Island, A., 249.  
 Quebec, analyses of, B., 1127.  
 reclaimed, effect of sulphur on, B., 440.  
 of Renmark Irrigation District, South Australia, B., 521.  
 at Rothamsted, *Azotobacter* test of fertility of, B., 1129.  
 Russian, A., 249.  
   maps of composition of, A., 1230.

Soils, salinised, effects of phosphates on, B., 37.  
   sandy, acid, action of calcium cyanamide and ammonium sulphate on, B., 199.  
   loam, potash fertilisers on, B., 440.  
   red, of Palestine, origin of pan ("Nasas") in, B., 1127.  
 Saskatchewan, determination in, of available phosphorus, B., 361.  
 semi-arid, rôle of nitrogen and significance of free fixation in, B., 1128.  
 "sick," B., 521.  
 silt, of Picardy, fertility of, B., 361, 566.  
 solonetz, amelioration of, B., 653.  
 S. African, A., 1230.  
 of the South-East, fertilisers for, B., 618.  
 South Indian, crop yields from, B., 317.  
 of the Southern Jordan valley, B., 73.  
 of southern Puerto Rico, A., 1230.  
 in S.W. England, effect of climate and parent material on, A., 597.  
 swamp, of Lower Murray River, classification of, A., 39.  
 Texas, manganese in, and its effect on crops, B., 440.  
 tractor-cultivated, *Azotobacter* in, B., 691.  
 tropical, A., 39.  
   single-value properties of, B., 951.  
   determination of saturation capacity of, B., 275.  
 of the United States and Canada, effect of air-drying on  $p_H$  of, B., 616.  
 vineyard, B., 477.  
 water, classification of, A., 39.  
 western, determination in, of phosphate deficiency by Neubauer and Wino-gradsky methods, B., 906.  
 Western Australian, alkalis in, B., 653.  
 of Yestfold, effects of liming on, B., 199.  
 Soils, analysis of, B., 122.  
   double plotting of, B., 855.  
   apparatus for, A., 1226.  
   separation of sesquioxides from alkaline-earths in, B., 1046.  
   by v. Wrangell's method compared with other methods and field experiments, B., 36.  
 determination of reaction of, using the "pehameter," B., 199.  
 mechanical analysis of, B., 653.  
   apparatus for, B., 1094.  
   use of centrifuge in, B., 691.  
   hydrometer for, B., 566.  
   manometers for, B., 952.  
   by pipette method, B., 1094.  
 use of law of exchange acidity in determination of association of adsorbed bases in, B., 36.  
 determination in, of aluminium, B., 1129.  
   of adsorbed bases, B., 811.  
   of replaceable bases, B., 35.  
   volumetrically, of total and exchangeable bases, B., 1095.  
   of boron, B., 617.  
   of adsorbed calcium, in presence of calcium carbonate, B., 743.  
   of carbon dioxide production, B., 566.  
   of carbonates, B., 199, 361.  
   of cellulose, A., 1179.  
   of chlorides, A., 353.  
   of clays by moisture absorption at 70% humidity, B., 780.  
   of fertiliser requirements, B., 478.  
   of  $p_H$ , B., 781.  
   with the antimony electrode, B., 199, 522.  
   colorimetrically, with barium sulphate, B., 73.  
   electrometrically and colorimetrically, B., 122, 361.

**Soils**, determination in, of  $p_H$ , with the quinhydrone electrode, B., 36, 361, 477.  
 by quinhydrone electrode and Kühn's colorimetric method, B., 906.  
 of iodine, B., 617.  
 of lime requirements, B., 74, 199.  
 of lime and phosphate requirements, B., 122.  
 of magnesia requirements, by means of *Aspergillus niger*, B., 276.  
 containing soluble organic matter, of nitrates, B., 477.  
 of total nitrogen, B., 743.  
 of nitrogen requirements, B., 276.  
 of nitrous and nitric nitrogen, B., 692.  
 of nutrient content, by means of their electrical conductivity, B., 276.  
 by Neubauer seedling test, B., 122.  
 of organic matter, B., 122.  
 of organic matter and carbonates, B., 906.  
 colorimetrically, of citrate-soluble phosphate, B., 855.  
 of phosphoric acid by Arrhenius' method, B., 854.  
 of available phosphorus, B., 158, 855, 906.  
 of phosphorus and potassium requirements, B., 617.  
 of assimilable plant nutrients, B., 1096.  
 of potash, B., 440, 1045.  
 of potassium, B., 1129.  
 of potassium requirements, with *Aspergillus niger*, B., 617.  
 of potassium, calcium, and phosphoric acid by electrodialysis and its relation to soil acidity, B., 744.  
 of exchange silicates, B., 1046.  
 of sodium, B., 855.  
 of exchangeable sodium, B., 653.  
 of vanadium, A., 591.  
 of water, B., 566, 1095.  
 with multiple electrodes, B., 440.  
**Soil extracts**, preservation of, B., 362.  
 micro-determination in, of phosphorus and arsenic, B., 362.  
**Soil solutions**, B., 566.  
 concentration and composition of, B., 743, 1045.  
 effect of changes in soil moisture on, B., 854.  
 $p_H$  of soils as function of moisture and concentration of, B., 906.  
 potassium in, B., 952.  
 determination of nutrient content of, by measurement of their electrical conductivity, B., 317.  
 measurement of salinity of, with Wheatstone bridge, B., 952.  
 use of law of exchange acidity for determination of salt concentration of, B., 36.  
**Solanaceæ**, determination of alkaloids in drugs from, B., 206.  
**Solanine**, detection of, A., 1147.  
**Solanum tuberosum**, mosaic disease in, A., 438.  
**Solder**, (P.), B., 1037.  
 recovery of, from scrap brass, etc., (P.), B., 731.  
 silver, B., 554.  
 and its use, B., 186.  
 soft, use of, B., 187.  
 wiping, physical properties of, B., 348.  
**Soldering**, fluxes for, (P.), B., 112, 943.  
 zinc chloride base flux for, (P.), B., 112.  
**Solids**, extraction apparatus for, A., 593.  
 separation of, by solution and crystallisation, B., 707.

**Solids**, separation of, from gases, (P.), B., 1013.  
 from liquids, (P.), B., 3, 868.  
 apparatus for, (P.), B., 485.  
 by vacuum cooling, (P.), B., 1108.  
 from suspensions, emulsions, etc., by evaporation, (P.), B., 486.  
 separators for, (P.), B., 661.  
 apparatus for separation and grading of, (P.), B., 629.  
 removal of adherent liquids from, (P.), B., 788.  
 removal of water from, (P.), B., 292.  
 drying of, B., 451.  
 application of diffusion equations to, B., 403.  
 apparatus for treatment of, under pressure and heat, (P.), B., 243.  
 effect of mechanical working on surfaces of, A., 219.  
 molecular scattering of light by, A., 559.  
 specific heat of, at liquid helium temperatures, A., 684.  
 adsorption of gases by, A., 331.  
 migration of adsorbed molecules on surfaces of, A., 688.  
 thermal diffusivity of, A., 442.  
 apparatus for dissolving of, (P.), B., 85.  
 velocity of reactions of, A., 1094.  
 velocity of solution and sublimation of, rotating in liquids, A., 916.  
 velocity of sound in, A., 905.  
 equilibria of, with gases, A., 16, 697.  
 energy exchange in collisions between gas atoms and, A., 316, 680.  
 reactions between, at high temperatures, A., 128.  
 effect of fused reaction products or preformed eutectics on, A., 584.  
 reactions of, with gases, A., 128, 234, 817, 1003, 1095.  
 contact apparatus for gases and, (P.), B., 581.  
 topochemical change of, in liquids, A., 22.  
 mixing of liquids and, (P.), B., 916.  
 preferential wetting of, by liquids, B., 1107.  
 introduction and withdrawal of, from vessels containing a medium under high pressure, (P.), B., 85.  
 finely-divided, mixing of, (P.), B., 964.  
 contact apparatus for gases and, (P.), B., 325.  
 apparatus for determination of water in, (P.), B., 292.  
 subdivided, feeding of, into enclosed reaction mixtures, (P.), B., 1060.  
 polished, structure of, A., 1078.  
 porous, calculation of moisture content in drying of, B., 371.  
 diffusion and surface-emission equations for drying of, B., 403.  
 sorption of condensable vapours by, A., 908.  
 velocity of adsorption of gases by, A., 908.  
 pulverised, separation of, (P.), B., 292.  
 mixing of, with liquids, (P.), B., 405.  
 sifters for, (P.), B., 406.  
 pulverulent, addition of liquids to, in air streams, (P.), B., 965.  
 transparent, apparatus for optical examination of, (P.), B., 1109.  
 volatile, determination of, by sublimation, A., 246.  
 visual detection of, in fluids, (P.), B., 133.  
 microchemical determination in, of water, B., 403.  
**Solid solutions**. See **Solutions**, solid.

**Solubility**, theory of, A., 1200.  
 and activated adsorption, A., 908.  
 multiply reversed curves of, A., 457.  
 of sparingly soluble compounds in presence of hydrophilic colloids, A., 802.  
 of gases, A., 222.  
 in liquefied gases, A., 990.  
 of salts, variation of, with temperature, A., 567.  
 at high temperatures, A., 457, 1205.  
 reciprocal, determination of, A., 1084.  
**Solutes**, hydrated and unhydrated ions in, A., 699.  
**Solutions**, crystallo-polyamphionic theory of, A., 911.  
 automatic control of concentration of, A., 37.  
 electrical control of concentration of, B., 191; (P.), B., 611.  
 freezing of, A., 124, 340.  
 adsorption at surface of, A., 992.  
 velocity of reaction in, A., 916.  
 application of Trouton's rule to, A., 567.  
 aqueous, f.p. of, A., 912.  
 surface films of insoluble substances on, A., 17.  
 capillarity in, A., 333.  
 binary boiling, composition of vapours from, A., 567.  
 colloidal. See **Colloidal solutions**.  
 concentrated, theory of, A., 696, 700.  
 thermodynamics of, A., 228.  
 conjugate, theory of, A., 801.  
 dilute, state of division of dissolved substances in, A., 19.  
 dilute and perfect, statistical mechanics of, A., 338.  
 electrolytic, absorption of shorter wavelength electric waves by, A., 214.  
 hydrotropic, A., 334.  
 polar, anomalous electrical dispersion of, A., 570.  
 solid, magnetic properties of, A., 1082.  
 thermal behaviour of, A., 990.  
 diffusion and segregation in, A., 907, 908.  
 relation between mixed crystals and, A., 14.  
 standard, substitute for soda lime for bottles for, A., 138.  
 viscous, boiling of, (P.), B., 4.  
 colorimetric analysis of, (P.), B., 86.  
**Solvents**, from manufacture of coal gas, B., 297.  
 recovery of, B., 927.  
 by the Bayer active-carbon process in manufacture of cordite, etc., B., 241.  
 ionic partition coefficients between, A., 457.  
 rates of evaporation of, B., 590.  
 evaporation rates and distillation range of, B., 1070.  
 influence of, A., 1083.  
 action of, A., 323, 678.  
 in chemical reactions, A., 22.  
 use of alkylamines as, B., 251.  
 use of aliphatic ketones as, B., 331.  
 jointing materials for pipes for, B., 601.  
 repairs to plant containing, B., 1027.  
 dry-cleaning, non-inflammable, manufacture of, (P.), B., 1069.  
 organic, effect of air on properties of, A., 328.  
 dissociation in, A., 696.  
 adsorption of, by charcoal, silica gel, etc., A., 992.  
 volatile, recovery of, for resin production, B., 190.  
 detection and determination of sulphur in, with mercury, B., 921.

- Soot, determination of true specific gravity of, B., 295.  
determination of, in air, A., 926.  
Sporifics, detection of, A., 424.  
Sorbic acid, addition of hypochlorous acid to, A., 930.  
Sorbicortol, A., 663.  
Sorbitol, A., 42.  
in marine algæ, A., 1177.  
hexaacetate, preparation of, B., 44.  
complex ferric compounds of, A., 362.  
detection of, in wines, B., 44.  
 $\alpha$ -Sorbitol benzoate, A., 929.  
*Sorbus aucuparia*. See Mountain ash.  
Sorbyl alcohol, and its derivatives, A., 496.  
Sorbyl chloride, A., 498.  
Sorghum, hydrocyanic acid in, A., 888.  
Sound, device for production of, from electrical variations, (P.), B., 685.  
absorbent material for, (P.), B., 26.  
dispersion theory of, A., 13.  
velocity of, in carbon dioxide, A., 328.  
in hydrogen, A., 13.  
in oxygen, A., 13.  
in solids, A., 905.  
Sound records, manufacture of, (P.), B., 737.  
material for, (P.), B., 475.  
Sound-proof materials, (P.), B., 727.  
Sows, pregnant, mineral requirements of, A., 1161.  
Soya beans, life-history and composition of plants of, A., 436.  
growth and germination of, A., 202.  
constituents of, A., 660.  
organic bases of, A., 1178.  
carbohydrate exchange in, A., 1180.  
lipin-oxidase in, A., 427.  
pentosans in, B., 912.  
protein, composition of, A., 182.  
treatment of, (P.), B., 270, 446, 622.  
prevention of oxidation of, (P.), B., 446.  
culture media for, A., 1067.  
soil reaction requirements of, B., 568.  
effect of available soil calcium on "damping-off" of seedlings of, B., 200.  
control of caterpillar on, in Louisiana, B., 363.  
oil tests on, B., 398.  
activity of products from, in anæmia, A., 1161.  
as source of calcium in diet, A., 1161.  
yeast and casein supplements to diet of, A., 643.  
American, cultivation of, in Germany, B., 200.  
in Germany in 1930, B., 205.  
ground, as protein supplement for calves, A., 1161.  
Philippine, composition of, B., 805.  
Soya-bean cake, and its hydrolytic product, "Soyament," comparative food value of, B., 1134.  
Soya-bean meal, B., 398.  
Soya-bean oil, extraction of, B., 30.  
determination of m.p. from refractive index in hydrogenation of, B., 994.  
hydrogenation of, B., 994.  
Philippine, composition of, B., 805.  
*Soya hispida*, influence of nodule bacteria on phosphatide production in, A., 653.  
Space chemistry, A., 902.  
Sparteine, pharmacology of, A., 198.  
Spear-mint oil, Florida, B., 577.  
Spectra, structure and selective absorption in, A., 208, 668.  
hyperfine structure of, A., 2, 104.  
relationship between valency and, A., 2.  
relative intensities in, A., 2.  
Spectra, intensity of lines in, A., 440.  
decomposition of intensity curves of, A., 552.  
separation of D-lines in, A., 1071.  
Fraunhofer lines in, A., 2.  
quadrupole lines in, A., 440.  
ultimate lines in, A., 1072.  
widening of lines in, A., 440.  
J-phenomena in, A., 208.  
multiplet splitting in, A., 1072.  
influence of, on Balmer lines, in weak magnetic fields, A., 1.  
coupling, broadening, and collision damping in, A., 552, 979.  
pressure shift and broadening of lines in, A., 668.  
sputtering of gratings for, A., 1225.  
of cosmic rays, A., 440.  
of diatomic molecules, A., 440.  
of electric discharges in gases, A., 439.  
of elements in sun and earth, A., 104.  
of two-electron systems, A., 2.  
of multi-electron systems, A., 4.  
absorption, relation of, to constitution, A., 791, 792.  
and optical activity, A., 899.  
splitting of, by lowering temperature, A., 896.  
in solution at low temperatures, A., 674.  
of heterocyclic compounds, A., 558.  
of light elements, A., 788.  
of organic compounds, effect of substitution on, A., 558.  
of salts, in liquid ammonia, A., 6.  
of solids, A., 896.  
of triatomic molecules, Z., 673.  
infra-red, A., 1075.  
effect of dilution and temperature on, A., 897.  
of aromatic and ethylenic compounds, A., 559.  
of mixed organic liquids, A., 6.  
and Raman, relation between, A., 675.  
near infra-red, of liquids, A., 6.  
ultra-violet, A., 674.  
intensity measurements in, A., 319.  
as evidence of additive compound formation, A., 1083.  
in relation to constitution of organic compounds, A., 557.  
and reactivity of organic compounds, A., 211.  
of ammoniacal solutions of salts, A., 444.  
of substances containing two chromophoric groups, A., 982.  
of organic compounds, A., 674.  
of optically active organic compounds, A., 320.  
K- and L-absorption, of lower elements, A., 12.  
arc, excitation of, A., 552.  
arc, glow, and spark, nomenclature of, A., 440.  
band, A., 2, 104.  
nuclear spin and structure of, A., 440.  
use of, in analysis, A., 586, 590.  
infra-red, of asymmetric molecules, A., 6.  
cathode-ray continuous, A., 553.  
complex, A., 668.  
theory of, A., 315.  
multiplet transitions in, A., 892.  
continuous, A., 440.  
from cathode-ray bombardment, A., 208.  
with high-current vacuum tube, A., 892.  
cross lattice, A., 681.  
Spectra, diffusion, and molecular symmetry, A., 320.  
emission, excitation of, in gases, A., 104.  
M- and N-series, A., 441.  
band, from metals in inert gases, A., 208.  
fluorescence and Raman, photography of, A., 321.  
infra-red, A., 444.  
and structure of tautomeric substances, A., 558.  
laminary reflexion gratings for, A., 108.  
damping in, to account for dielectric loss, A., 1075.  
in electric fields, A., 1188.  
photography of, A., 982.  
of polyatomic molecules, A., 212.  
of small particles, A., 212.  
long wave, A., 444.  
line, series in, A., 439.  
molecular, A., 673.  
and structure, A., 211, 444, 791.  
and intermolecular forces, A., 1075.  
intensity distribution in, A., 1074.  
in analysis, A., 1074.  
predissociation, of triatomic molecules, A., 896.  
Raman, A., 897.  
and constitution of substances of high mol. wt., A., 559.  
intensity in, A., 792, 897.  
intensities of Stokes and anti-Stokes lines in, A., 108.  
effect of isotopes on, A., 1188.  
circular polarisation of, A., 108.  
and free rotation, A., 897.  
in relation to infra-red absorption spectra, A., 213.  
of amorphous and crystalline solids, A., 7.  
of hydrocarbons, A., 675.  
of liquids, A., 445.  
of geometric isomerides, A., 7.  
 $\beta$ -ray, A., 556.  
permanent magnet for, A., 555.  
continuous, A., 895.  
 $\gamma$ -ray, A., 556.  
X-ray, A., 105, 316, 553, 669, 892.  
angular intensity distribution of, A., 105.  
intensity of secondary lines in, A., 553.  
partial absorption in, A., 892.  
effect of non-columbian fields on, A., 980.  
of heavy elements, A., 979.  
absorption, A., 208, 553, 788.  
structure of, A., 1184.  
K-series, relation between constitution and, A., 562.  
continuous, A., 892.  
continuous and discrete, A., 553.  
emission, A., 1072.  
influence of lattice binding forces on, A., 325.  
fluorescent, A., 441, 553.  
soft, A., 105.  
K-series, A., 788.  
K- and L-series, of erbium-rhenium series, A., 3.  
M-series, A., 669.  
recombination, in positive column of metal vapours, A., 1071.  
reflexion, of solids, A., 557.  
resonance series, extinction of, and their transformation into band spectra, A., 315.  
secondary, graphic interpretation of, A., 926.  
spark, of gases, A., 103.  
ultra-violet, projection of, A., 713.

- Spectrograms, interpretation of, A., 557.  
wedge, production of, A., 245.
- Spectrographs, glass, analysis with, A., 355.  
large grating, A., 592.  
luminous, A., 246.  
prism, of large focal length, A., 3.  
quartz, analysis by, A., 1220.  
quartz monochromator, A., 924.  
X-ray, oscillator for, A., 357.  
reflexion, A., 924.
- Spectrography, detection of elements by, in biological material, A., 294.
- Spectrometers, double-crystal, theory of, A., 3.  
infra-red, A., 592, 1188.  
mass, A., 668.  
mirror, A., 104.  
X-ray, two-crystal, A., 669, 1225.
- Spectrophotometers, A., 137, 713.  
polarising system for, A., 245.  
for analysis of alloys, A., 1105.
- Spectrophotometry, calibration in, A., 713.
- Spectroscopes, pentagonal comparison prism for, A., 245.  
multiple interference, A., 669, 788, 1078.
- Spectroscopic analysis, A., 35, 355.  
use of band spectra in, A., 586, 590.  
and molecular spectra, A., 1074.  
of volatile liquids, (P.), B., 822.  
absorption, micro-Baly tube for, A., 36.  
emission, B., 1083.  
high-frequency radiation, A., 979.  
mitogenetic, A., 544.  
organic, Raman effect in, A., 954.  
qualitative, A., 1220.  
quantitative, A., 35, 486, 586, 826.  
photometric eyepiece for, A., 924.  
spinhtharometer for, A., 1225.  
of alloys, A., 355.  
of gaseous mixtures, A., 353.
- X-ray, cathode ray effect in, A., 244.  
quantitative, A., 35.  
spark-in-flame, A., 824.
- Spectroscopy and valency, A., 901.  
photographic plates for use in, B., 162, 657.  
band, application of, in photochemistry, A., 237.
- Spermaceti oil, saponification of, (P.), B., 946.
- Spermine in human tissues, A., 184.
- Spessartite, paramagnetic rotation of, A., 448.
- Sphagnum fimbriatum*, composition of, A., 889.
- Sphalerite, fibrous, of Aachen lead-zinc deposits, A., 494.
- Spherulites, optics of, A., 564.  
artificial, A., 564.
- Sphingomyelin, crystal growth of, A., 1154.
- Spices, testing of, by luminescence microscopy, B., 749.  
determination in, of essential oils, B., 80, 1137.
- Spiders, red, greenhouse, control of, B., 202, 813.
- Spilanthol, constitution of, and its derivative with maleic anhydride, A., 1239.
- Spinach, response of, to change in photo-period, A., 549.  
vitamins in, B., 911.
- Spinasterols, and their esters, A., 381.
- Spinels, A., 114, 830.  
formulae of, A., 495.  
lattice structure of, A., 12, 798.  
lattice constants of, A., 114, 326.  
formation of, A., 801.  
aluminium-zinc, A., 1218.  
chrome, properties of, B., 548.
- Spinels, magnesium and zinc, crystal structure of, A., 903.  
zinc-chromium, thermal formation of, A., 1008.
- Spinning apparatus, centrifugal, (P.), B., 462.
- Spinning cakes, washing and after-treatment of, (P.), B., 462.
- Spinnometer, application of, B., 460, 673.
- Spinhtharometer, reproducible, for quantitative spectroscopy, A., 1225.
- Spirits, artificial ageing of, by means of catalysts, B., 746.  
glass apparatus for taste analysis of, B., 282.  
analysis of, by fractional distillation, B., 44.  
determination in, of fusel oil, B., 700.
- Spirographis-hæmin, A., 292.
- Spirographis-porphyrin, A., 292.
- Spirogyra*, effect of water polymerides on cells of, A., 977.  
effect of fertilisers on sugar utilisation by, A., 202.
- Spleen, influence of, on carbohydrate and fat metabolism, A., 1160.  
on cholesterol metabolism, A., 423.  
rôle of, in genesis of bile pigments, A., 766.  
relation of, to iron metabolism, A., 1068.  
action of enzymes of, on proteins, A., 777.  
hormones of, A., 1171.  
malarial pigment in, A., 1057.  
horse, lipins of, A., 959.  
human, proteolytic enzymes of, A., 535.  
artificial, manufacture of, (P.), B., 461.  
from cellulose, A., 123.
- Spores, membranes of, A., 665, 784.  
treatment of materials containing, (P.), B., 128.  
differential stain for, A., 198.
- Sporopollenins, thermal behaviour of, A., 784.
- Sprays, B., 571.  
injury by, B., 569.  
liquid, fungicidal properties of, B., 857.  
oil, tank-mixture method for use of, B., 955.  
deposition of oil by, B., 202.  
as insecticides, B., 201.  
mineral oil, toxicity of, to vegetation, B., 857.  
tar-distillate, efficiency of, B., 812.  
control of San José and scurfy scales with, B., 812.  
winter, in West Midlands, B., 857.
- Spraying of liquids affected by air, (P.), B., 464.
- Spraying apparatus, (P.), B., 373.  
for liquids, nozzles for, (P.), B., 965.  
for solidification of liquids by cooling, (P.), B., 1109.  
for paints, emulsions, etc., (P.), B., 1127.
- Springs, manufacture of wire for, from mild ingot steel, B., 551.
- Spruce, effect of alkali concentration on kraft pulp from, B., 302.  
Canadian and Russian, pulping value of, by the sulphite process, B., 673.
- Spruce bark, Rumanian, tanning effect of infusions of, B., 564.
- Squalene, hydrogenation of, at high pressure, A., 141.
- Squalus acanthias*, xylose as measure of glomerular filtrate in, A., 1277.
- Squash, White Bush, carbohydrate content of, A., 99.
- Stachydrine, formation of, in plants, A., 975.
- Stachyose, constitution of, A., 1116.
- Staining of fixed cells, A., 766.  
biological, A., 1154.  
azo-dyes for use in, (P.), B., 58.  
picro-Congo red, A., 294.  
vital, and permeability, A., 295.
- Stand oil, B., 116.  
manufacture of, B., 560.  
cooking of, on gas fires, B., 1125.
- Standard state, activities and, A., 227.
- Stannates. See under Tin.
- Stannite, Spanish, A., 248.
- Staphylococcus*, oxidation-reduction potential of cultures of, A., 197.  
growth stimulant for, A., 1169.  
antigens and antibodies of, A., 430.  
intracellular bacteriophage in lysis of, A., 308.  
tin compounds in chemotherapy of, A., 90.
- Staphylococcus pullorum*, intracellular toxin in, A., 1291.
- Staphylotoxin, hæmolysis by, A., 430.
- Stars, spectra of, A., 104, 441.  
red-band spectrum of, A., 211.  
chemical composition of atmospheres of, A., 238.  
influence of absorption rays of hydrogen on colorimetric determination of temperature of, A., 211.  
white dwarf, constitution of, A., 5.
- Star-aniseed oil, hydrocarbons in, B., 128.
- Starch, A., 100.  
constitution of, A., 1201.  
manufacture of, (P.), B., 746.  
from sweet potatoes, B., 76.  
separation of, from materials, (P.), B., 42.  
degradation of, during mashing, B., 1101.  
sizing and finishing quality of, B., 1050.  
physical chemistry of, A., 338.  
properties of, from temperate and tropical climates, A., 1177.  
colloidal properties and constitution of, A., 46.  
isomerism of, A., 934.  
physico-chemical degradation of, A., 465, 571.  
sols, gelatinisation of, A., 694.  
phosphorus, nitrogen, and silicon content of, A., 255, 256.  
fission of, by artificial peroxidase, A., 346.  
enzymic fission of amyloses from, A., 193.  
hydrolysis of, by amylase, A., 881, 1063.  
effect of amino-acids on, by Cumbu amylase, A., 91.  
by malt amylase, A., 881.  
by carbonic acid, A., 26.  
by malt-diastase in presence of proteins, A., 193.  
effect of light on, A., 543.  
diastatic hydrolysis of, A., 47.  
products of diastatic saccharification of, B., 319.  
reaction of, with dilute alkali, A., 1238.  
production of conversion products of, (P.), B., 1132.
- trichloroacetate*, A., 502.  
nitrates, A., 604.  
formation of amylopectin from, A., 370.  
conversion of, into dextrin, (P.), B., 77.  
pastes of dextrin and, for treatment of textiles, B., 1050.  
hexosans from, A., 724.  
resinous condensation products of phenols and, (P.), B., 518.  
combination of, with proteins, A., 1274.  
manufacture of adhesives from, (P.), B., 698.  
origin of, in plants, A., 100.

**Starch**, formation of, in plants, A., 660.  
deposition of, in plants, A., 100.  
accumulation of, in green leaves, A., 1180.  
edible-canna and potato, physico-chemical properties of, B., 572.  
cassava, fatty acids from, A., 832.  
maize, and its amyloses, hydrolysis of, A., 500.  
potato, nitrates of, A., 604.  
phosphoric acid in, B., 814.  
 $\alpha$ - and  $\beta$ -diastase in saccharification of, A., 1286.  
microchemistry of, A., 100.  
soluble, manufacture of, (P.), B., 42.  
cold water-soluble, dry, (P.), B., 77.  
wheat, rice, and potato, heats of hydration of, B., 282.  
reaction of, with iodine, A., 485.  
staining tests for, B., 857.  
determination of quality of, by a colour reaction, B., 857.  
differential analysis of, A., 255.  
detection in, of iron, with pyrocatechol, B., 1050.  
determination of, polarimetrically, B., 698.  
by Rask's method, B., 159.  
in cereal products, B., 127.  
in cotton goods, B., 61.  
in plant tissues, A., 1296.  
**Starch-liquefying power**, determination of, A., 90.  
**Starch products**, determination in, of ash, B., 957.  
of moisture, B., 42.  
**Starch syrup**, analysis of, B., 41.  
**Steam**, generation of, from blast-furnace gas, B., 1011.  
centrifugal apparatus for purification of, (P.), B., 822.  
separation of liquid particles from, (P.), B., 663.  
removal of oxygen from, (P.), B., 823.  
deflection-type separators for, (P.), B., 663.  
fuel economy in furnaces for, B., 483.  
effect of removal of gases from apparatus heated by, on their steam consumption, B., 819.  
superheaters for, (P.), B., 243, 755.  
furnaces for superheating of, (P.), B., 292.  
de-superheating of, (P.), B., 84.  
supplying of, to jackets of dryers, boilers, etc., (P.), B., 1012.  
fluorescence of, A., 213.  
humidity of mixtures of air and, B., 404.  
high-temperature, materials for use in plant for, B., 347.  
superheated, copper alloy fittings for use in, (P.), B., 190.  
See also Water vapour.  
**Steam generators**, (P.), B., 131.  
**Stearic acid**, crystal structure of, A., 893.  
autoxidation of, A., 931.  
precipitation of, from alcoholic and ethereal solutions, A., 118.  
smokes of. See under Smokes.  
acid potassium salt, A., 1018.  
magnesium and zinc salts, detection of, in cosmetics, B., 50.  
**Stearic acid**, *tetrabromo*-, from linoleic acid, configuration of, A., 832.  
*dihydroxy*-, oxidation of, by potassium permanganate in acetone, B., 313.  
**Stearin**, production of, from hardened fats without pressing, B., 777.  
from cod-liver oil as source of vitamin-D, A., 783.

$\alpha$ -**Stearylstearic acid**, ethyl ester, A., 499.  
**Steel**. See under Iron.  
**Steenstrupine**, A., 493.  
*Stemona tuberosa*, alkaloid from root of, A., 406.  
**Stemonine**, A., 406.  
**Stencil sheets**, (P.), B., 18, 462, 543, 768, 797.  
production of, (P.), B., 336.  
*Stephania tetrandra*, alkaloids of, A., 1048.  
**Stephanite**, crystal structure of, A., 904.  
**Stercobilin**, A., 864.  
hydrochloride, A., 296.  
*Sterculia tragacantha*, oil from seeds of, B., 1039.  
**Stereochemistry**, A., 726, 1190.  
early development of, A., 449.  
and structure, A., 1037, 1253.  
of crystalline compounds, A., 796.  
**Stereokinematography**, X-ray, A., 245.  
**Stereokinetics**, A., 234.  
*Stereum hirsutum*, effect of, on wood, A., 195.  
**Steric hindrance**, A., 1242.  
and collision diameters, A., 996.  
and isomerism, A., 844.  
**Sterilisation**, compositions for, (P.), B., 402.  
of casks, etc., (P.), B., 663.  
of foods, apparatus for, (P.), B., 79.  
of liquids, (P.), B., 754.  
of metal utensils in dairies, etc., (P.), B., 914.  
**Sterols**, formulæ for, A., 844.  
ring system of, A., 736, 1131.  
carbon skeleton of, A., 736.  
action of selenium oxide on, A., 381.  
pharmacology of, A., 312.  
metabolism of. See under Metabolism.  
colour reaction of, A., 844.  
**Sterol group**, A., 267, 845, 1127.  
additive compounds and mixed crystals in, A., 737.  
*Stevia rebaudiana*. See Kaá-hé-ê.  
**isoSteviol**, A., 46.  
**Stevioside**, A., 313.  
hydrolysis of, A., 46.  
**Stigmasteryl methyl ether**, A., 737.  
**Stilbene**, crystal structure of, A., 114.  
colour dimorphism of, A., 1080.  
**Stilbene dyes**, substantive, manufacture of, (P.), B., 57.  
**Stilbene-4:4'-distibinic acid**, A., 867.  
**Stilbene-4:4'-distibinous oxide**, A., 867.  
**Stilbene-2:2'-disulphonic acid**, salts and derivatives of, A., 730.  
**Stills**, (P.), B., 1012.  
increasing efficiency of, B., 1059.  
electrically-heated, (P.), B., 629.  
oil, reserve apparatus for, (P.), B., 875.  
generation of power from vapours from, (P.), B., 93.  
pipe, heat transmission in convection sections of, B., 579.  
shell, batteries of, B., 1059.  
sun, B., 483.  
tube, heat transmission in radiant sections of, B., 579.  
**Stirrers**, bicycle-chain, A., 246.  
**Stomach**, physiology of, A., 1275.  
protective mechanism of, against corrosion by hydrochloric acid, A., 1055.  
excretion of dyes by, A., 534.  
resorption of dyes by mucous membrane of, A., 773.  
**Stomata**, movements of, A., 1295.  
and  $p_H$ , A., 661.  
permeability of cells of, to urea, A., 314.  
**Stone**, machines for breaking and grinding of, (P.), B., 661.  
crushers for breaking of, (P.), B., 405.

**Stone**, pitmen for crushers for, (P.), B., 85.  
screening plant for, (P.), B., 184.  
artificial, manufacture of, (P.), B., 107, 679, 1033.  
from lime, (P.), B., 889.  
de-aëration of binding agents used in, (P.), B., 263.  
moulding of, (P.), B., 26.  
manufacture of products from, (P.), B., 773.  
for dental models, B., 308.  
building, manufacture of, (P.), B., 727.  
Vindhyan, weathering of, B., 727.  
cast, physical properties of, B., 308.  
natural, pressure elasticity of, B., 937.  
effect of heat on, B., 937.  
preservation of, B., 148.  
precious, synthetic, surface treatment of, (P.), B., 105.  
wet, coating of, (P.), B., 601.  
**Stone bond** for chimney-stacks, reservoirs, etc., (P.), B., 508.  
**Stopcocks**, removing "frozen" plugs from, A., 925.  
pressure, A., 1014.  
**Stovaine**, detection of adulterants in, B., 751.  
**Straw**, B., 976.  
decomposition of, without chemicals, B., 236.  
by fungi, A., 93.  
production of cellulose from, (P.), B., 501.  
production of hard sheet paper from, B., 880.  
barley, effect of potash manuring on growth and mechanical properties of, B., 1096.  
cereal, lignin from, A., 888.  
rotted, hemicelluloses of, A., 888.  
wheat, lignin in, B., 124.  
**Straw pulp**, production of, for straw board, (P.), B., 501.  
**Strawberries**, effect of  $p_H$  on growth of, in sand and soil, B., 782.  
**Strawberry plants**, Dunlap, carbohydrate composition of, A., 100.  
*Streptococcus*, production of lactic acid by, A., 653.  
metabolism of, A., 883.  
hæmolytic, animal and human, A., 653.  
 $\beta$ -hæmolytic, hæmolysis by, in blood-agar, A., 94.  
*Streptococcus hæmolyticus*, proteins in scarlatinal strain of, A., 197.  
**Strontium**, isotopic constitution and atomic weight of, A., 209.  
**Strontium alloys** with cadmium, B., 187.  
**Strontium arsenate**, basic, preparation of, A., 125.  
carbonate, crystal structure of, A., 12.  
dissociation equilibria of, A., 468.  
perchlorate, production of, (P.), B., 599.  
chloride, production of, from brine, (P.), B., 724.  
fluoberyllate, A., 583.  
hydride, spectrum of, A., 439.  
nitrate, heat of dilution of, A., 23, 913.  
oxide, equilibrium of arsenic pentoxide, water, and, A., 125.  
peroxide octahydrate, crystal structure of, A., 1079.  
sulphide, phosphorescence of, A., 1216.  
**Strontium detection** :—  
detection of, A., 489.  
distinction between lithium and, by flame test, A., 1103.  
**isoStrophanthic acids**, derivatives of, A., 749.  
**Strophanthidin**, structure of, A., 1138.  
position of lactone group in, A., 748.  
dehydrogenation of, A., 948.

- Strophanthin**, A., 748, 948, 1138.  
determination of, volumetrically, A., 955.
- g-Strophanthins**. See **Ouabains**.
- Strophanthus**, oil from, B., 1137.  
assay of, compared with ouabain, A., 964.  
biological assay of, A., 1284; B., 1136.
- Structure**, determination of, chemically and spectrochemically, A., 49.
- Strychnidine salts**, A., 406.  
derivatives of, by action of cyanogen bromide, A., 866.
- neoStrychnidine**, A., 406.
- Strychnine**, A., 167, 178, 406, 527, 628, 1147.  
constitution of, A., 953.  
oxidation of, A., 866.  
salts, A., 290.  
derivatives, colour reactions of, A., 179.  
methosulphate, reduction products of, A., 628.  
sulphate,  $p_H$  of solutions of sodium glycerophosphate and cacodylate and, B., 79.  
neutralisation of toxicity of, A., 648.  
identification of, optically, A., 290.  
detection of, in poisoning cases, A., 301.  
determination of, in plants, B., 128.
- neoStrychnine**, and its *N*-oxide, A., 527.
- ψ-Strychnine**, and its salts, A., 1147.
- Strychnine**, oximino-, A., 629.
- Strychnine-*p*-carboxylic acid**, A., 407.
- Strychninesulphonic acid**, relationship of, to brucinesulphonic acid, A., 953.
- Strychnos alkaloids**, A., 179, 407, 866, 953.  
reactions of, A., 629.
- Styphnic acid**, A., 1245.  
crystal structure of compounds of acenaphthene and, A., 564.  
compounds of, with phenols, A., 942.
- Styrene**, manufacture of, (P.), B., 13, 195.  
and its homologues, (P.), B., 793.  
and its homologues, manufacture of polymerisation products of, (P.), B., 57, 72, 519.  
bromide, preparation of, B., 12.
- Styrene**, *α*-chloro-*p*-bromo-, dibromide, A., 374.
- m*-Styrene**, chloro-derivatives, manufacture of, (P.), B., 494.
- Styrenes**, polymerised, manufacture of sulphonated derivatives of, (P.), B., 591.
- Styrenes**, nitro-, reduction of, to *ω*-phenyl-ethylamines, A., 506.
- 2-*p*-Styryl-6-acetamidoquinoline**, 2-*p*-amino-, derivatives of, A., 623.
- β-Styrylacrylcrotonic acid**, methyl ester, A., 600.
- 2-Styryl-6-aminoquinoline**, 2-*p*-amino-, laetyl derivative, methochloride, A., 623.
- 3-Styryl-1-(bromostyryl)benzene**, 4:6-*di*-nitro-, A., 941.
- 3-Styryl-1-*α*-bromostyrylbenzene**, 4:6-*di*-nitro-, A., 176.
- 2-Styryl-3-isobutylchromone**, 7-nitro-2-*m*-nitro-, A., 520.
- Styryl *tert*-butyl ketone**. See **Benzylidenepinacolone**.
- Styrylcarbamic acid**, ethyl ester, A., 253.
- 3-Styryl-1-*α*-chlorostyrylbenzene**, 4:6-*di*-nitro-, A., 176.
- 2-Styrylchromone**, A., 520.
- β-Styrylcrotonic acid**, methyl ester, A., 600.
- 2-Styryldimethylchromones**, and *m*-nitro-, A., 519.
- 2-Styryl-3-ethylchromone**, nitro-, A., 519.
- 2-Styryl-3-ethylchromones**, bromo-, *mono*- and *di*-chloro-, and nitro-, A., 520.
- 2-Styryl-3-ethyl-1:4-β-naphthapyrone**, A., 1257.
- 2-*p*-Styryl-6-glycerylamidoquinoline**, 2-*p*-amino-, and its acetyl derivative, salts of, A., 623.
- 2-*p*-Styryl-6-lactamidoquinoline**, 2-*p*-amino-, methochloride, A., 623.
- 2-Styryl-3-methylchromone**, 7-hydroxy-, and its acetyl derivative, A., 520.
- 2-Styryl-8-methyl-3-ethylcoumarin**, A., 519.
- Styryl methyl ketones**, oximation of, and *α*-bromo-, and their derivatives, and *α*-chloro-, A., 387.
- 2-Styryl-3-methyl-1:4-*α*-naphthapyrone**, A., 520.
- 2-Styryl-3-methyl-1:4-β-naphthapyrone**, A., 1257.
- 2-Styryl-1:4-*α*-naphthapyrone**, A., 520.
- 2-Styryl-1:4-β-naphthapyrone**, and its dibromide, A., 859.
- 2-Styrylperinaphthothiazine**, A., 176.
- 1-Styrylnorhydrastinine**, *o*-nitro-, A., 1262.
- Styrylphenylacet-*NN'*-diethylamidine**, β-chloro-, and its chloroplatinate, A., 371.
- 2-Styryl-3-propylchromones**, bromo-, chloro-, nitro-, and 7-nitro-2-*m*-nitro-, A., 519.
- 2-Styryl-3-propyl-1:4-β-naphthapyrones**, A., 1257.
- Styrylquinoline**, trypanocidal action of derivatives of, A., 623.
- Styrylquinolinecarboxylamides**, and their trypanocidal action, A., 522.
- 3-Styryltolane**, 4:6-*di*-nitro-, A., 941.
- Subcrystalline materials**, X-ray structure of, A., 1080.
- Suberic acid**, *p*-phenylphenacyl ester, A., 745.
- Submaxillary glands**, dog's, organic phosphorus compound in, A., 637.
- Substance**,  $C_8H_5O_2N_2S$ , from 5-bromo-5-methylbarbituric acid, silver carbonate and hydrogen sulphide, A., 523.
- $C_7H_{15}N_5S_2$ , from dimethylammonium propyldithiocarbamate and formaldehyde, A., 150.
- $C_8H_5O_2N$ , from 5-chloroacridone and dimethylaniline, A., 169.
- $C_{10}H_{14}O_8$ , from soya-bean protein, A., 182.
- $C_{10}H_{17}O_2N$ , from cyclohexanolcarboxylamide and acetone, A., 865.
- $C_{11}H_{16}O_8$ , and its derivatives, from leaves of *Ginkgo biloba*, A., 1138.
- $C_{11}H_{20}O_7$ , from *d*-mannitol and acetylacetone, A., 514.
- $C_{12}H_{14}O_{10}$ , from succinphenylhydrazide, A., 1234.
- $C_{12}H_{13}ONS$ , from 2-keto-1:2-dihydrobenzothiazole, sodium propionate and propionic anhydride, A., 64.
- $C_{14}H_9O_3N_3$ , from reduction of *o*-nitrobenzaldehyde, A., 513.
- $C_{14}H_{17}O_2N$ , from 2-diethylaminomethylcyclohexanone and *o*-aminobenzaldehyde, A., 168.
- $C_{16}H_{14}O_6$ , and its derivatives, from leaves of *Ginkgo biloba*, A., 1138.
- $C_{16}H_{12}O_2N_2$ , from 2-quinolone and methyl anthranilate, A., 67.
- $C_{16}H_{24}ON_2$ , from magnesium cryptopyrryl bromide and oxygen, A., 285.
- $C_{17}H_{18}O_5S_2Na_2$ , from *ω*-benzenesulphonylacetophenone, *p*-toluenesulphonylacetone and carbon dioxide, A., 837.
- $C_{18}H_{14}ON$ , and its derivative on hydrolysis, from 2-chloro-4:7-dimethylquinoline and anthranilic acid, A., 66.
- $C_{18}H_{22}O_2N_2$ , paramagnetism of, A., 324.
- Substance**,  $C_{18}H_{22}O_2N_2$ , from methylglyoxal and hydrocyanic acid, A., 720.
- $C_{19}H_{30}O$ , and its derivatives, from cholesterol and cuprous chloride, A., 510.
- $C_{22}H_{36}O_4$ , from hydrogenation of ethyl *α*-truxillate, A., 614.
- $C_{22}H_{16}O_2$ , from acraldehyde and 2:5-diphenyl-3:4-benzofuran, A., 1257.
- $C_{22}H_{30}O_8Cl_{12}$ , from butylchloral and gallic acid, A., 848.
- $C_{24}H_{16}O_3N_2S_2$ , from magnesium 2-thienyl bromide and isatin, A., 753.
- $C_{26}H_{33}O_{14}Cl$ , from dye of *Papaver rhæas*, A., 934.
- $C_{28}H_{16}O_{12}N_4$ , and its isomer, from nitration of benzilic acid, A., 1129.
- $C_{28}H_{16}O_4$ , from anthraquinone-2-carboxylic acid, anthracene, and aluminium chloride, A., 1135.
- $C_{30}H_{28}O_2$ , from *αβ*-diphenylpropane-*αβ*-diol and phosphoric oxide, A., 273.
- $C_{32}H_{32}O_2$ , from *αβ*-diphenylbutane-*αβ*-diol and phosphoric oxide, A., 273.
- $C_{38}H_{40}O$ , from triphenylmethyl and perbenzoic acid, A., 379.
- $C_{38}H_{56}Cl$ , from tri-*tert*-butylethynylcarbinol and titanium trichloride, A., 497.
- Succindialdehyde**, condensation of, with methylamine and malonic acid, A., 741.
- Succinic acid**, formation of, from acetic acid, A., 831.  
heat of combustion of, A., 229.  
ferrous salt, A., 42.  
ethyl ester, dipole moment and free rotation of, A., 899.  
*ω*-polyethylene ester, A., 601.  
*αα*-diacyl derivatives, ethyl esters, cleavage of, A., 1112.  
determination of, in wines and fermented fruit juices, B., 1051.
- l*-Succinic acid**, *l*-chloro-, equilibria of, with *d*- and *l*-phenylglycollic acids, 1205.
- Succinodehydrogenase**, preparation of, from fumarase, A., 650.  
action of ions on, A., 880.
- Succinosuccinic acid**, ethyl ester, heteroring formation from anilino-derivatives of, A., 754.
- Sucrose (saccharose, cane-sugar)**, manufacture of, from formaldehyde, (P.), B., 1050.  
attempted synthesis of, A., 500.  
apparatus for treatment of, with quicklime, (P.), B., 77.  
conductivity of salts and alkalis in solutions of, A., 1206.  
Raman spectrum of solutions of, A., 320.  
production of colloidal solutions of, (P.), B., 1101.  
crystallography of, A., 904.  
behaviour of organic colouring matters in crystallisation of, B., 654.  
velocity of crystallisation of, A., 331.  
gelation of, with metal hydroxides, A., 1202.  
equilibrium of, with calcium oxide and water, A., 341.  
spontaneous ignition of, B., 745.  
decomposition of, under pressure, A., 1115.  
in low-grade massecuites, B., 442.  
hydrolysis of, A., 1063, 1094.  
catalytic influence of dried cellulose on, A., 705.  
hydrolysis of concentrated solutions of, by invertase, A., 193.



Sucrose, inhibition of enzymic hydrolysis of, A., 91.  
 inversion of, A., 346.  
   effect of neutral salts on, by acids, A., 233, 476; B., 41.  
   in dilute solutions in presence of hydrochloric acid, A., 127.  
   formation of ethylglucoside in, by Clerget method, B., 524.  
 methylation of, A., 603.  
 peptisation of calcium carbonate by, A., 19.  
 compounds of, with surface-active substances, A., 1200.  
 detection of, in milk, B., 204.  
 detection and determination of, by means of invertase, A., 1269.  
 determination of, A., 603.  
   colorimetrically, A., 724.  
   in beer, B., 43, 364.  
 determination in, of reducing sugars, B., 814.  
 See also Sugar.  
 Sucrose-sulphuric acid, hydrolysis of, by sulphatase, A., 650.  
 Suction apparatus, automatic, A., 1013.  
 Sugar, production of, (P.), B., 76, 280, 480, 858.  
   from beetroots, cane, etc., (P.), B., 319.  
   at Eynsham factory, B., 279.  
   application of decolorising carbons in, B., 571.  
   inversion in, B., 956.  
   effect of leucostocin in, B., 909.  
   standard alkalinity and removal of calcium salts in, B., 1004.  
 extraction of, from sugar cane, beetroots, etc., (P.), B., 1050.  
 refining of, B., 397, 1099, 1101.  
   with activated carbon, B., 1099.  
 use of animal charcoal in, B., 1099.  
 spray drying of, (P.), B., 746.  
 bleaching material for, (P.), B., 422.  
 colouring and flavouring of, (P.), B., 1101.  
 decolorisation of, (P.), B., 1101.  
   with bone-black after filtration, B., 909.  
 carbonatation of, B., 524.  
 apparatus for crystallisation of, (P.), B., 917.  
 growth of crystals of, B., 442.  
 sweetening-off scums from, B., 910.  
 destruction of, on shelves and in wagonettes in refineries, B., 857.  
 diffusion batteries for, B., 1.  
 losses of, at diffusion battery, B., 202.  
 decrease of losses of, in final molasses, B., 41.  
 action of, on amino-acids, A., 1239.  
 production of nutriment containing, (P.), B., 321.  
 use of, in feeding-stuffs, B., 160.  
 viscous preparations of, (P.), B., 397.  
 compounds of lime and, B., 41.  
 elimination of thermophilic bacteria from, B., 319.  
 beet, manufacture of, B., 203, 524.  
   in Moravia and Silesia, B., 363.  
   use of carbon dioxide in carbonatation of, B., 910.  
   washing of carbonatation scums from, B., 910.  
   crystallisation of, B., 910.  
   diffusion batteries and continuous diffusers for, B., 75.  
   deterioration of, B., 1050.  
   sapogenin from, A., 46.  
   raw, standards for affining quality of, B., 75.  
   determination of affining values of, B., 41, 279, 1049.  
   analysis of, in Germany, B., 910.

Sugar, cane, inversion in manufacture of, B., 1132.  
   utilisation of defecation scum from manufacture of, B., 41.  
   control of boiling of, B., 41.  
   raw, refining quality of, in relation to boiling, B., 956.  
   refined, thermophilic bacteria in, B., 1132.  
 invert, paper sacks for packing of, for transport, (P.), B., 814.  
 detection of, in honey, B., 279.  
 determination of, iodometrically, in sugar factory products, B., 279.  
   polarographically, A., 1237.  
 Natal, sulphur dioxide in, B., 125, 126.  
 storage of, B., 1004.  
 loss in polarisation of, on storage, B., 126.  
 raw, refining quality of, B., 1049.  
 keeping quality of, B., 1049.  
 deterioration of, on storage, B., 396.  
*Torula* inoculation for prevention of deterioration of, B., 442.  
 standard, of the Prague Merchandise and Stock Exchanges, B., 572.  
 apparatus for affining of, (P.), B., 42.  
 determination of affination number of, B., 910, 1049.  
   effect of humidity during storage on, B., 1049.  
 conductometric determination of ash of, B., 910.  
 raw or refined, determination in, of reducing sugars, B., 1132.  
 refined, damp, inversion of, by moulds, B., 1050.  
 moulded and pressed, mechanical properties of, B., 1049.  
 volume-weight of, B., 1099.  
 white, manufacture of, (P.), B., 77.  
   from cane-sugar juice, (P.), B., 280.  
   in the "San Pablo" factory, B., 479.  
 impurities in, B., 279, 1099.  
 determination in, of chlorides, B., 1099.  
   of nitrogen, B., 279.  
   of phosphorus and silica, B., 857.  
 wood, digestibility of, A., 773.  
 analysis of, B., 1100.  
 determination of, in apples, B., 41.  
 Sugars, A., 1113.  
 determination of molecular weight of, cryoscopically, in liquid ammonia, A., 501.  
 and their derivatives, determination of ring structure of, A., 722.  
 synthesis of, A., 147.  
 configurations of  $\alpha$ - and  $\beta$ -forms in, A., 371.  
 photosynthesis of, A., 480.  
 manufacture of, from cellulose materials, B., 1101; (P.), B., 42.  
 effect of mixing of, on their affinity, B., 203.  
 and their derivatives, rotation and structure of, A., 1237.  
 photo-electric measurement of ultra-violet rotatory dispersion of, A., 984.  
 m.p. of, A., 835.  
 adsorption of, A., 689.  
   by blood-charcoal, A., 1199.  
 oxidation of, catalytically, by oxygen in presence of iron pyrophosphates, A., 147.  
 oxidation and degradation of, A., 831.  
 oxidising action of, A., 27.  
 fermentation of, A., 305.  
 precipitation of, by metallic hydroxides, A., 368, 933, 1020.

Sugars, comparative ketolytic action of, A., 1279.  
 formation of active reducing agents of, A., 345.  
 reaction of, with amino-acids, A., 605.  
   with potassium cyanide, A., 834.  
 xanthate reaction with, A., 718.  
 acids of, A., 833.  
 acidic property of, A., 231.  
 alcohols from, A., 42, 928.  
 derivatives of, containing sulphur, A., 45.  
 acetyl derivatives of lactones from, A., 43.  
 trimethylamine derivatives, reactions of, A., 369.  
 optical properties of phenylsazones and other derivatives of, A., 933.  
 containing nitrogen, A., 1118.  
 assimilation of, in relation to bile acids, A., 875.  
 influence of cholic acid on resorption of, in intestines and liver, A., 962.  
 aldose and ketose, distinction between, by oxidation with bromine, A., 145.  
 ketone, A., 1115.  
 methylated, reactivity of, A., 145, 500.  
 reducing, spectrum of, A., 1020.  
 detection of, A., 499, 1238.  
 determination of, by Bruhn's method, B., 524.  
   colorimetrically, A., 867.  
   in foods, A., 857.  
   iodometrically, A., 1236.  
   volumetrically, A., 500, 529.  
   in biological fluids and foods, A., 206.  
   in sucrose, B., 814.  
   in raw sugars, B., 956.  
   in raw or refined sugar, B., 1132.  
 refined, determination of apparent density of, B., 572.  
 mycological identification of, A., 545.  
 detection of, by the Molisch test, B., 204.  
 determination of, by Bertrand's method, A., 722.  
   colorimetrically, A., 1115.  
   with de Jong's reagent, A., 666.  
   by titration with iodine and alkali, A., 603.  
   volumetrically, by the Bertrand-Meissl method, B., 364.  
   in plant extracts, A., 666.  
   in vegetable materials, B., 857.  
 conductometric determination of ash of, B., 956.  
 $\alpha$ - and  $\beta$ -Sugars, oxidation of, A., 602.  
 Sugar beet. See Beetroots, sugar.  
 Sugar cane, effect of nitrogen on growth of, B., 395.  
 fertilisers for, B., 1096.  
   in Natal, B., 1047.  
 phosphate fertilisers for, B., 1002.  
 optimum  $p_H$  of nutrient medium for, B., 1047.  
 ammonia or nitrates as sources of nitrogen for, B., 1047.  
 soya beans and green manures for, B., 856.  
 milling of, (P.), B., 858.  
 mannitol and dextran in jellying of molasses from, B., 76.  
 hydrolytic acidity of soils of plantations of, B., 478.  
 rate of decomposition of organic matter of, under field conditions, B., 856.  
 production of cellulose and hydrocarbons from, (P.), B., 796.  
 Sugar factories, laboratory apparatus for, B., 1100.  
 use of electrometric  $p_H$  apparatus in, B., 698.  
 corrosion of evaporator tubes in, B., 469.

- Sugar factories, use of kieselguhr as filter-aid** in, B., 956.  
 treatment of effluents from, with chlorinated soda solution at the Teutschenthal factory, B., 81.  
 determination of sugar in waste waters from, B., 1100.
- Sugar juice, purification of, with base-exchange agents with amphoteric cations**, B., 1131.  
 Teatini process for, B., 278.  
 defecation and purification of, (P.), B., 319.  
 clarification of, B., 571.  
   with fractional defecation, B., 479.  
   with sulphurous acid, B., 1098.  
 filtration of, (P.), B., 4.  
 decolorisation of, with active carbon, B., 1099.  
   with chlorine and norit, B., 698.  
 defecation of, with lime, B., 1098.  
 pre-defecation of, B., 1098.  
 boiling of, B., 1098.  
 evaporation of, B., 957.  
   two-effect pressure, B., 42.  
 carbonatation of, B., 40, 203, 479, 910.  
   influence of final alkalinity in, B., 203.  
 fractional liming of, B., 1098.  
 sulphitation of, with sodium bisulphite, B., 203.  
 variations in, in large tanks, B., 1048.  
 "available sugar" in, B., 1099.  
 of high density, filtration of, B., 814.  
 beet, purification of, B., 909.  
   by base-exchange, B., 1098.  
   role of calcium carbonate in, B., 1098.  
   by dry and wet liming, B., 1131.  
   reduction in consumption of lime for, B., 278.  
   by the magnesia process, B., 363.  
   with Redoid Z. N., B., 1131.  
 centrifugal purification of, before liming, B., 908.  
 clarification of, with lime, B., 40.  
 lime economy in, B., 442.  
 effect of molasses on, B., 479.  
 filtration of, with the Sauerbrey-Jung ceramic pressure filter, B., 909.  
 liming of, B., 909.  
 pre-liming of, B., 363, 956, 1098, 1131.  
 carbonatation of, B., 396.  
   drying of scums from, B., 571.  
   removal of calcium formate in, B., 571.  
   influence of carbon monoxide on, B., 571.  
   physical and chemical activity of lime in, B., 1131.  
   influence of invert sugar on removal of amino-acids in, B., 203.  
 defecation of, B., 571.  
 depuration of, (P.), B., 42.  
 flocculation of, in alkaline medium, B., 1097.  
 saturation of, in relation to hydrostatic pressure of the froth, B., 619.  
 formation of colouring substances in, B., 1049.  
 proteins and other nitrogen compounds of, B., 1097.  
 behaviour of sulphites, sulphates, silica, and nitrogen in, B., 479.  
 containing precipitated organic calcium compounds, action of carbonic and sulphurous acids on, B., 40.  
 carbonated, influence of liming on filtration of, B., 40.  
 thick, refining of, B., 203.  
 clarified, deposit on strainers for, B., 203.
- Sugar juice, cane, clarification of, in relation to phosphate content**, B., 40.  
 by the Teatini process, B., 203, 479.  
 liming and clarification of, B., 76.  
 preservation of, by refrigeration, B., 1003.  
 determination in, of hydrophilic colloids, B., 1097.  
 carbonated, pre-defecation by return of, B., 479.
- Sugar products, "salometer" electrical ash apparatus for**, B., 480.  
 apparatus for determination of turbidity of, B., 1100.  
 sensitivity of Sandera pocket nepheloscope for testing of, B., 1100.
- Sugar solutions, viscosity of**, B., 1099.  
 control of addition of reagents to, (P.), B., 164.  
 colour formation in, in defecation and saturation, B., 1049.  
 decolorisation of, with animal charcoal, B., 910.  
 as culture media, effect of heat on, A., 1291.  
 alkaline, catalytic action of iron in decolorisation of, B., 40.
- Sugar syrups, production of**, (P.), B., 397.  
 froth fermentation in, B., 396.  
 refining of, (P.), B., 1050.  
 treatment of, with lime, phosphoric and sulphurous acids, B., 442.  
 cane, relationship between ash content and electrical conductance of, B., 1100.  
 table, manufacture of, from raw cane juice, B., 1049.
- Sum latifolium*, essential oil of, B., 785.
- Sulphamide, preparation of**, A., 849.  
 magnetic susceptibility and density of, A., 1191.  
 dielectric constants of aqueous solutions of, A., 322.
- Sulphatase from bacteria, hydrolysis of glucose- and sucrose-sulphuric acids by**, A., 650.
- Sulphates. See under Sulphur.**
- Sulphate pulp, production of**, (P.), B., 768.  
 forced-circulation evaporation in, B., 674.  
 apparatus for recovery of chemicals from liquors from, B., 1023.
- Sulphatoberyllates. See under Beryllium.**
- Sulphatodimercuriacetoacetanilide**, A., 938.  
**Sulphatodimercuriacetoacetic acid, ethyl ester**, A., 938.  
**Sulphatodimercuriacetoacet-toluidides**, A., 938.
- Sulphæmoglobinæmia after use of "pyridium"**, A., 89.
- Sulphides, aromatic, crystal structure of**, A., 987.  
 organic, compounds of, with metallic salts, A., 251.  
 phosphorescent, A., 560, 793.  
 dissolved, detection of, A., 490.  
 detection of, in steel, B., 265.  
 determination of, in Portland cement, B., 344.
- polySulphides, parachor measurements of**, A., 112.  
 determination of, iodometrically, A., 921.
- Sulphites. See under Sulphur.**
- Sulphite liquors, waste, detection of, in sea water**, B., 626.
- Sulphite pulp, production of, from resinous conifers**, (P.), B., 142.  
 sulphur-burners for, B., 598.  
 alloy steel for use in, B., 680.  
 control of quality of cellulose in, B., 673.  
 liquors for, (P.), B., 639.
- Sulphite pulp, production of, effect of high sulphur dioxide concentration in**, B., 673.  
 sulphur and pyrites as sources of sulphur dioxide for, B., 177.  
 for filaments and films, (P.), B., 543.  
 heating of liquors for, (P.), B., 1116.  
 cooking of, B., 542, 836, 1023.  
 theory of, B., 795.  
 temperature of, B., 1073.  
 indirect, B., 499.  
 determination of degree of, B., 499.  
 analysis of cooking acids for, B., 594.  
 digestors for, B., 1073; (P.), B., 639.  
 stainless steel digester for, (P.), B., 1086.  
 chromium-nickel-iron castings for plant for, B., 1073.  
 treatment of liquors from, (P.), B., 838.  
 concentration of liquors from, B., 837.  
 use of waste liquors from, as fungicide, B., 202.  
 burning of residue from, in powdered-fuel furnaces, etc., B., 966.  
 influence of spruce lignin on, B., 499.  
 unbleached, determination of degree of decomposition of, B., 335.
- Sulpho-4-amino- $\alpha$ -naphthaleneazo- $\alpha$ -naphthaleneazo-6-sulpho- $\beta$ -naphthyl sodium sulphite**, A., 609.
- 1-p-Sulphobenzeneazo-2:3-benzcarbazole, and its sodium salt**, A., 265.
- p-Sulphobenzeneazobenzeneazo-8-sulpho- $\beta$ -naphthyl sodium sulphite**, A., 609.
- 1-p-Sulphobenzeneazo-2:7-dihydroxy-naphthalene**, A., 264.
- 1-Sulphobenzeneazo-2-phenylhydrazino-naphthalene, derivatives of**, A., 265.
- 4'-Sulpho- $\alpha$ -benzoylbenzoic acid, production of**, (P.), B., 1020.
- Sulphodehydrothiitoluene-p-arsinic acid**, A., 176.
- 7-Sulphofluorene-9-carboxylic acid, derivatives of, and 2-amino-**, A., 1129.
- 5-Sulpho-2-hydroxybenzeneazo- $\beta$ -naphthyl sodium sulphite**, A., 610.
- 4-Sulpho-2-hydroxy- $\alpha$ -naphthaleneazo- $\beta$ -naphthyl sodium sulphite**, A., 610.
- Sulphonamides, N-chloro-**, A., 608.
- Sulphonanilide, amino-**, A., 261.
- Sulphonation of fatty oils, etc.**, (P.), B., 495.
- Sulphones, dipole moment and structure of**, A., 507.
- $\alpha$ -Sulphonodibutyric acids**, A., 499.
- Sulphonic acids, formation of, from dithioacids**, A., 367, 932.  
 manufacture of, (P.), B., 221, 415.  
 for use as wetting, dispersing, emulsifying agents, etc., (P.), B., 671.  
 esters, manufacture of, (P.), B., 95.  
 aliphatic, salts, reduction of, with phosphorus bromides, A., 1018.
- Sulphonic groups, removal of, from rings, by electrolytic reduction**, A., 939.
- 4-Sulpho-5-nitro-2-hydroxy- $\alpha$ -naphthaleneazo- $\beta$ -naphthyl sodium sulphite**, A., 610.
- Sulphonium compounds, action of, on the nervous system**, A., 425.
- Sulphonyl bromides, reduction of, with phosphorus tribromide**, A., 1023.  
 fluorides, aliphatic, A., 365.
- N-Sulphonylacetanilide, N-chloro-**, A., 153, 608.
- N-Sulphonylamides, N-chloro-**, A., 608.
- N-Sulphonylbenzanilide, N-chloro-**, A., 153, 608.
- N-Sulphonylformanilide, N-chloro-**, A., 153, 608.
- N-Sulphonyl-p-toluenesulphonanilide, N-chloro-**, A., 153, 608.

*N*-Sulphonyl-*p*-toluenesulphonoluidides, *N*-chloro-, A., 153, 608.  
 $\alpha$ -Sulpho- $\beta$ -phenylpropionic acid, and its salts, A., 268.  
 Sulphophenylpropionic acids, A., 268.  
 3-Sulphophthalic acid, and its anhydride, barium salts, A., 396.  
 $\beta$ -Sulphopropionic acid, action of mercuric salts on formation of, A., 367.  
 Sulphosalicylic acid, strontium salt, compound of, with aminopyrine, A., 1284.  
 $\kappa$ -Sulphoundecic acid, and its disodium salt, A., 408.  
 Sulphoxides, dipole moment and structure of, A., 507.  
 Sulphur atoms, influence of, on reactivity of adjacent atoms or groups, A., 26.  
   mobility of groups containing, A., 837.  
   valency angle of, A., 984.  
   production of, pure, (P.), B., 22.  
   from hydrogen sulphide and sulphur dioxide, (P.), B., 104.  
   and alkali sulphates, from alkali bisulphites, (P.), B., 980.  
   recovery of, from the dioxide, (P.), B., 886, 936.  
   from gas-purifying materials, (P.), B., 466, 762.  
   from pyrites, etc., (P.), B., 547.  
   from roaster gases, (P.), B., 262.  
   from sludge, (P.), B., 104.  
   from smelter gases, (P.), B., 1029.  
   from sulphur ores, (P.), B., 262.  
   recovery and purification of, (P.), B., 1079.  
   purification of, (P.), B., 936.  
   removal of arsenic from, (P.), B., 725.  
   removal of carbonaceous matter from, (P.), B., 725.  
   improvement of colour of, (P.), B., 1029.  
   spectrum of, A., 207.  
   quadruplets in spectra of chlorine, nitrogen, oxygen, and, A., 315.  
   fluorescence spectrum of, A., 1072.  
   *K* X-ray spectrum of, A., 105, 553.  
   electron affinity of, A., 680.  
   affinity of metals for, A., 573.  
   vapour, magnetic susceptibility of, A., 795.  
   heating curves of, B., 519.  
   sublimation of, (P.), B., 886.  
   sols, oxidation of, by halogens, A., 1211, 1212.  
   equilibrium of, with calcium and oxygen, A., 574.  
   burners for, B., 677.  
   for sulphite-pulp mills, B., 598.  
   oxidation of different forms of, A., 32.  
   and its dioxide, reactions of, with calcium sulphate, A., 913.  
   effect of alkali and alkaline-earth sulphides on reaction of phosphorus trichloride with, A., 347.  
   removal of, from gases, B., 375; (P.), B., 341, 586, 1018.  
   from hydrocarbons, etc., (P.), B., 299.  
   from tar acids, B., 586.  
   fungicidal action of, B., 201, 1097.  
   in comparison with that of selenium and tellurium, B., 1048.  
   volatilisation of, for fungicidal purposes, (P.), B., 422.  
   effect of, on crops, B., 567.  
   on soils, B., 567.  
   distribution of, in proteins, A., 1149.  
   effect of, on leucocytes in blood, A., 868.  
   effect of isobarbituric acid on excretion of, A., 877.  
   colloidal, A., 19.  
   discoloured, treatment of, (P.), B., 547.

Sulphur, plastic, physical properties of, A., 452.  
   precipitated, A., 1081.  
   reducible, determination of, colorimetrically, A., 241.  
 Sulphur compounds, absorption spectra of, A., 319.  
   Smekal-Raman effect in, A., 213.  
   with iodides, structure of, A., 114.  
   containing oxygen, constitution of, A., 984.  
   gaseous, distribution of, in air, B., 841.  
   determination of, in air, A., 135.  
 Sulphur monochloride freezing points of mixtures of hydrochloric acid and, A., 228.  
   chlorides, A., 677.  
   Sulphuryl chloride, structure and dipole moment of, A., 1190.  
   reactivity of, A., 608.  
   molecular compounds of, A., 687.  
   Thionyl chloride, structure and dipole moment of, A., 1190.  
   interaction of, with substances containing reactive methylene group, A., 840.  
   molecular compounds of, A., 687.  
 Sulphur hexafluoride, physical properties of, A., 905.  
   hydride. See Hydrogen sulphide.  
   monoxide, band spectrum of, A., 981.  
   dioxide, production of, (P.), B., 146, 341.  
   and iron oxide, from iron sulphide ores, (P.), B., 770.  
   recovery of, from gases, (P.), B., 547, 600.  
   from mixed gases, (P.), B., 981.  
   from products obtained in treatment of mineral oils, (P.), B., 249.  
   removal of trioxide from, (P.), B., 547.  
   separation of, from gases, (P.), B., 325.  
   infra-red absorption spectrum of, A., 1075.  
   Raman effect and structure of, A., 320.  
   Raman spectra of, A., 7.  
   thermochemistry of, A., 469, 470.  
   heat of adsorption of, on sodium chloride, A., 459.  
   molecular volume of, A., 1190.  
   viscosity of, A., 685.  
   absorption of, by calcium phosphate, B., 677.  
   equilibrium of, with calcium oxide, A., 1090.  
   complex vanadium catalysts for conversion of, into the trioxide, B., 463.  
   catalytic oxidation of, in presence of tin vanadate, B., 20.  
   reduction of, with hydrogen and carbon monoxide from 380° to 850°, B., 339.  
   action of, on calcium phosphates, A., 30.  
   molecular compounds of, A., 687.  
   preservation of dried fruit with, B., 861.  
   as a refrigerant, B., 659.  
   removal of, from gases, (P.), B., 1029.  
   detection of, A., 587.  
   determination of, by distillation methods, B., 259.  
   by the Reisch test, B., 640.  
   in air, B., 914.  
   apparatus for, A., 135; B., 841.  
   in burner gases, B., 61, 463.  
   in sulphuric acid plants, B., 722.  
 trioxide, absorption spectrum of, A., 981.  
   post-dissociation radiation from, A., 981.  
   regulation of temperature of gases containing, (P.), B., 886.  
   molecular volume of, A., 1190.  
   absorption of, by water vapour, B., 260.

Sulphur trioxide, reaction of, with carbon tetrachloride, A., 816.  
   oxides, removal of, from gases, (P.), B., 828.  
 Sulphurous acid, and its salts, A., 345, 703.  
   production of, B., 546; (P.), B., 725.  
   absorption spectra of solutions of, in relation to autoxidation, A., 558.  
   reduction of, to hydrogen sulphide, A., 825.  
   change of acidity produced by salts in solutions of, A., 346.  
   preservation of foods with, B., 47.  
   determination of, in beer, B., 204.  
 Sulphites, action of light on solutions of, A., 1006.  
   formation of dithionates by oxidation of, A., 703.  
   preparation of dithionates by sulphonation of, A., 1219.  
   acid, manufacture of liquors containing, (P.), B., 506.  
   analysis of, A., 710.  
   detection of, with ultra-violet light, A., 1009.  
   determination of, iodometrically, A., 242.  
 Sulphuric acid, catalytic production of, A., 578.  
   manufacture of, (P.), B., 770.  
   use of ammonia oxidation plant for, (P.), B., 21.  
   by the chamber process, A., 124, 1219; B., 20.  
   lead sheets for, B., 840.  
   by the contact process, A., 28; B., 338; (P.), B., 420, 723, 1028.  
   relative merits of platinum and vanadium catalysts for, B., 381.  
   at Trail, B.C., B., 798.  
   by Petersen's tower process, B., 258, 979, 1118.  
   from flue gases, (P.), B., 339.  
   using magnesium carbonate, B., 840.  
   from weak sulphur dioxide gas, (P.), B., 464.  
   determination of sulphur dioxide in plant for, B., 722.  
   reaction towers for, (P.), B., 21.  
   in plant designed for burning of copper concentrates, B., 381.  
   recovery of oxides of nitrogen in, (P.), B., 770.  
   catalytically, oxidation of sulphurous acid in, B., 1077.  
   recovery of, from acid sludge from oil refineries, (P.), B., 339.  
   from waste acids from refining of mineral oils, (P.), B., 180.  
   purification of, from treatment of petroleum distillates, (P.), B., 227.  
   concentration and bleaching of, from parchmentsing, (P.), B., 884.  
   removal of nitric acid from, A., 239.  
   Raman spectrum of, A., 320.  
   activity coefficients of, in anhydrous acetic acid, A., 912.  
   specific heats of aqueous solutions of, A., 1197.  
   molecular volume of, A., 1190.  
   heat capacities of aqueous solutions of, A., 222.  
   inhibition of adsorption of ethylene by, A., 1085.  
   velocity of absorption of nitrous vapours by, B., 304.  
   equilibrium of, with nitrobenzene and water, A., 698.  
   corrosion in plant for, B., 1077.

- Sulphur:—**  
 Sulphuric acid, decomposition of bottle glass by, B., 790.  
 contact converters for, B., 1076.  
 drums for storage, etc., of, B., 504.  
 estimation of output of, B., 144.  
 indicators for mixtures of perchloric acid with, A., 921.  
 analysis of, A., 587.  
 detection in, of nitrous oxides and iron by Molisch's test, B., 419.  
 determination of, in presence of chromium salts, A., 587.  
 in water, B., 50.  
 Sulphuric acid, fuming (*oleum*), freezing points of mixtures of nitric acid and, B., 1077.  
 Sulphates, production of, (P.), B., 181, 934.  
 from potassium aluminous minerals, (P.), B., 227.  
 from water-soluble sulphites or bisulphites, (P.), B., 62.  
 removal of traces of iron from aqueous solutions of, B., 145.  
 Raman spectrum of, A., 7.  
 determination of, as barium sulphate, A., 1009.  
 microvolumetrically, A., 34.  
 nephelometrically, A., 487.  
 volumetrically, A., 923.  
 in biological fluids, A., 978, 1070.  
 in water, B., 50.  
 Hyposulphites, determination of, with azo-dyes, B., 545.  
 Persulphuric acid and its salts, manufacture of, by electrolysis, (P.), B., 192.  
 Persulphates, reaction of, with iodides, A., 584.  
 detection of, with 2:7-diaminofluorene hydrochloride, A., 242.  
 determination of, A., 587.  
 volumetrically, A., 710.  
 Pyrosulphuric acid, and its salts, structure of, A., 902.  
 Pyrosulphites, crystal structure of, A., 903.  
 Thiosulphates, kinetics of reaction of, with bromoacetates, A., 815.  
 decomposition of, in presence of arsenious acid, A., 703.  
 reaction of, with bromoacetates, A., 1211.  
 detection of, and their separation from other sulpho-salts, A., 1010.  
 Thionates, chemistry of, B., 884, 1028.  
 Dithionates, preparation of, A., 1219.  
 decomposition of, A., 484.  
 Trithionates, A., 352.  
 Polythionates, formation of, in soils from sulphur, B., 1128.  
 Sulphur organic compounds, formation of, from ethylenic hydrocarbons, A., 928.  
 manufacture of, (P.), B., 13, 459.  
 molecular rearrangement in, A., 262.  
 aromatic, germicidal activity of, A., 844.  
 Sulphuric acid, esters, manufacture of, (P.), B., 495.  
 cyclic esters of, A., 250.  
 Disulphides, containing S-S linking, reaction of, with chloramine-T, A., 1017.  
**Sulphur detection and determination:—**  
 analysis of suspensions of, used as insecticides, B., 441.  
 detection of, in motor fuels and solvents, B., 921.  
 detection and determination of, in petroleum distillates, B., 1065.  
**Sulphur detection and determination:—**  
 determination of, in benzol, B., 790.  
 gravimetrically, in biological material, A., 1182.  
 in brass and bronze, B., 310.  
 in coal, B., 214, 534, 870.  
 in coal and coke, B., 51, 582.  
 in South African coals and shales, B., 166.  
 in foods, B., 1103.  
 in fuels, B., 534.  
 in gases, B., 246, 323.  
 in graphite, B., 51, 326.  
 volumetrically, in cast iron and steel, B., 425.  
 in mineral oils, B., 327.  
 in organic compounds, A., 291, 631, 867, 1149.  
 in presence of mercury, A., 955.  
 in crude petroleum, B., 968.  
 iodometrically, in polysulphides, A., 710.  
 in pyrites, B., 546.  
 in soft vulcanised rubber, B., 156.  
 in steel, B., 265.  
 in urine, photometrically, A., 295.  
 Sulphuric acid. See under Sulphur.  
 Sulphurous acid. See under Sulphur.  
 $\beta$ -Sulphydryl- $\beta$ -phenylpropiophenone. See Phenyl  $\beta$ -thiol- $\beta$ -phenylethyl ketone.  
 Sumach berries, dibasic acids in waxes from, A., 313.  
 Sumaresinolic acid, and its derivatives, A., 61.  
 Sun, spectrum of corona of, A., 552.  
 magnesium in spectrum of, A., 315.  
 oxygen bands in spectrum of, A., 103.  
 intensity of rays of, A., 492.  
 measurement of ultra-violet rays from, A., 896.  
 Sun spots, spectrum of, A., 892.  
 Sun stills. See under Stills.  
 Sunfish, stimulation of, by acids, A., 963.  
 Sunflower, changes in composition of seeds of, with sowing time, A., 1180.  
 Sunflower seeds, utilisation of hulls of, B., 994.  
 Sunflower seed oil, production of, B., 647.  
 purification of, with dilute caustic soda, B., 994.  
 Sunflower silage, feeding value of, and its effect on cows' milk, A., 283.  
 Sunlight, tropical, photosynthesis in, A., 480, 706.  
 winter, in Chicago, antirachitic efficiency of, A., 98.  
 Superconductivity, A., 565, 905.  
 Hall effect and, A., 114.  
 and wave mechanics, A., 453.  
 with high-frequency alternating currents, A., 684, 1193.  
 at high frequencies, A., 115.  
 Superheaters, (P.), B., 1013.  
 Superphosphates, production of, (P.), B., 980.  
 from Ukrainian low-grade phosphates, B., 62.  
 water-soluble phosphoric acid content of, B., 420, 545.  
 changes in mixtures of, with limestone and with dolomite, B., 884.  
 storage of mixtures of calcium cyanamide and, B., 694.  
 calculation of effect of, on cereals, B., 123.  
 action of, on acid mineral soils, B., 617.  
 percolation of basic slag and, on soils, B., 1045.  
 ammoniated, solubility of, B., 382.  
 available phosphoric acid in, B., 382.  
 Superphosphates, double, production of, from phosphorites, B., 101.  
 triple, determination of potassium in, B., 62.  
 Superpolymerides, linear, A., 601.  
 Supersaturation, A., 802.  
 Suprarenal glands, separation of constituents of, A., 184.  
 hyperglycemic activity of extracts of, A., 779.  
 biochemistry of cortex of, A., 779.  
 Surfaces, electrical conductivity of, A., 1206, 1207.  
 thermodynamics of phenomena at, A., 1200.  
 Surface energy of liquids, A., 799.  
 of molecules, A., 453.  
 Surface tension, measurement of, A., 828.  
 meters for, A., 492.  
 variation of, with phase composition, A., 690.  
 and interfacial tension, A., 333.  
 separation of solutes by, A., 460.  
 of aliphatic acids, A., 690.  
 of binary systems, A., 340.  
 of dyes, A., 993.  
 of emulsions, A., 336.  
 Surgical dressings, (P.), B., 401, 624.  
 Surgical sewing materials, sterilised, manufacture of, (P.), B., 1008.  
 Sweat, acid-base balance in, A., 1056.  
 Sweat glands, effect of activity of, on uric acid and phosphate excretion in urine, A., 640.  
 Swedes, changes in composition of, during storage, B., 285.  
 Sweetmeats, containing uncooked vegetable juices, (P.), B., 240.  
 Swelling, A., 20, 122.  
 Swine, food requirements of pregnancy in, A., 643.  
 growing, nutrition of, with calcium compounds, A., 87.  
 Switches, mercury, (P.), B., 776.  
 Switch oils, purification of, (P.), B., 876.  
 deoxidiser for, (P.), B., 590.  
 Sylvine, Compton effect for, A., 669.  
 scattering of X-rays from, at low temperature, A., 113.  
 Sylvinite, production of sodium and potassium nitrate fertiliser from, B., 1002.  
 Sylvite, plasticity of, A., 1080.  
 determination of potassium chloride in, A., 488.  
*Synanthedon exitiosa*, control of, in young trees, B., 1130.  
 Syngenite, A., 38.  
 Synthalin, A., 540.  
 action of, A., 431.  
 Syphilis, colloid chemistry in serum diagnosis of, A., 297.  
 blood-proteins in, A., 537.  
 viscosity of blood-serum in, A., 187.  
 proteins in serum in, A., 960.  
 chemotherapy with indium in, A., 297.  
 treatment of, with sodium iodobismuthite, A., 1058.  
 Syringio acid, preparation of, and its derivatives, A., 161.  
 Syrups, pharmaceutical, viscosity of, B., 575.  
 Systems, binary, A., 573.  
 fractionation of, A., 1197.  
 transformation of constituents of, A., 913.  
 curves representing properties of, A., 908.  
 conductivity, surface tension, viscosity and m.p. of, A., 340.

Systems, binary, equilibria in, under pressure, A., 810.  
 aromatic, analysis of, by viscosity and density gradients, A., 941.  
 conjugated, A., 729.  
 reactivity of, A., 521.  
 dicyclic, three-carbon tautomerism in, A., 1032.  
 disperse, effect of ultra-violet light on, A., 570.  
 electric conductivity and capacity of, A., 461.  
 dielectric behaviour of, A., 461, 462.  
 hydrodynamics of, A., 18.  
 osmosis and solvation of, A., 570.  
 ageing and hysteresis in, A., 19.  
 heterogeneous, kinetics of, A., 816.  
 micellar, plasticity of, A., 564.  
 oxidation-reduction, complex-formation in, A., 1207.  
 symmetrical triad prototropic, A., 384.  
 ternary, A., 341, 1091.  
 transformation of constituents of, A., 913.

## T.

Tabacilin, A., 1177.  
 Tabacinin, A., 1177.  
 Tablets, containing drugs, etc., production of, (P.), B., 708.  
*Tachardia lacca*, growth of, B., 851.  
 Takapyrophosphatase in tuberculosis, A., 874.  
 Talc, mined in Shabrovsk, inertness of, to fuel slag, B., 546.  
 Ural, ceramic properties of, B., 983.  
 Talc-carbonate rock, thermal analysis of, B., 979.  
 Talisay oil, Philippine, from seeds of *Terminalia calappa*, B., 805.  
 Tallow, bleaching of, with New Zealand fuller's earth, B., 69.  
 goat's, Swiss, B., 805.  
*d*-Talonlic acid, and its  $\gamma$ -lactone, A., 602.  
*d*-Talose, synthesis of, from *d*-galactose, A., 933.  
 Tanacetone. See Thujone.  
 Tangents, calculation of, A., 594.  
 Tanks, reduction of evaporation losses in, (P.), B., 662.  
 Tanneries, leaching in, B., 1001.  
 treatment of wastes from, B., 1106.  
 Tannic acid, mercury salt, determination of, B., 702.  
 Tannin in hops, barley husks, and wort coagulum, B., 858.  
 extraction of, from pine bark, B., 740.  
 from vegetable or animal matter, (P.), B., 212.  
 absorption of, by cellulose, B., 1127.  
 structure-viscosity of aqueous and alcoholic solutions of, A., 227.  
 dyeing, Japanese, B., 1127.  
 hop, B., 121.  
 synthetic, and their salts, as disinfectants for seeds, B., 75.  
 vegetable, A., 61.  
 analysis of, B., 121, 359, 394.  
 hide powder for, B., 359.  
 and the "Parker effect," B., 157.  
 determination of, in tea, B., 46.  
 in wattle bark, B., 652.  
 in wines, B., 77.  
 in wood barks, B., 564.  
 determination in, of insoluble matter, B., 1001.  
 filtration of solutions in, B., 780.

Tannin extracts, production of, from bark of *Eucalyptus calophylla*, B., 741.  
 sulphited, detection in, of sulphites, B., 852, 853.  
 detection and determination of, B., 852, 853.  
 vegetable, evaluation of, B., 852.  
 detection of sulphite cellulose in, B., 359.  
 analyses of, B., 120.  
 detection in, of sulphite cellulose, by Procter-Hirst reaction and effect of humic acids in decayed wood thereon, B., 809.  
 oxidation in determination in, of moisture by indirect method, B., 810.  
 Tanning, (P.), B., 121, 360, 565, 951.  
 of hides, etc., (P.), B., 565, 742.  
 of skins and hides, (P.), B., 616.  
 chrome, B., 476, 905.  
 theory of, B., 741.  
 physical chemistry of, B., 521.  
 double-bath, absorption of chromic acid in, B., 72.  
 Tanning agents, (P.), B., 198.  
 manufacture of, (P.), B., 121, 173, 252, 1114.  
 from naphtha, B., 1045.  
 Tanning drums, graphical representation of height of liquid added to, B., 853.  
 Tanning extracts, manufacture of, (P.), B., 521.  
 function of non-tans in, B., 689.  
 chestnut, prepared from bark and debarked wood, differences between, B., 394.  
 frozen, sampling of, B., 359.  
 sulphited, contact electrode for determination of  $p_H$  of, B., 810.  
 contact electrode for determination of  $p_H$  of, B., 905.  
 Tanning liquors, influence of alkalinity on tan in, B., 1001.  
 fermentation in, B., 1001.  
 chrome, one-bath, basicity of, B., 690.  
 vegetable, corrosion of metals by, B., 552, 801.  
 formation of moulds and acids in, B., 741.  
 used, accumulation of non-tans in, B., 853.  
 ammonia method for determination of acidity of, B., 951.  
 determination in, of lactic acid, B., 1001.  
 Tanning materials, manufacture of, (P.), B., 238, 951.  
 from mineral oils, (P.), B., 742.  
 from pyrocatechol, (P.), B., 652.  
 extraction of, B., 740.  
 absorption of oxygen by, B., 741.  
 effect of, on metals, B., 72.  
 action of potassium dichromate on, B., 616.  
 Swiss pine barks as, B., 740.  
 of the British Empire, B., 565.  
 from Italian Somaliland and Trans-Juba, B., 852.  
 Indian, B., 564.  
 South African, B., 1044.  
 vegetable, absorption of oxygen by, B., 809.  
 oxidising enzymes in, B., 1001.  
 Chinese, B., 438.  
 analysis of, B., 852, 853.  
 conductometric analysis of, B., 853.  
 sampling of, for analysis, B., 359, 565\*.  
 evaluation of, B., 1045.  
 Tantalum, structure of, A., 895.  
 production of, electrolytically, (P.), B., 513.

Tantalum, removal of carbon impurities from, (P.), B., 112.  
*N* lines in spectrum of, A., 788.  
 photo-electric properties of, A., 105.  
 thermal properties of, A., 565.  
 thermo-electric properties of, A., 1207.  
 crystal structure of, A., 1192.  
 oxide layers on, A., 450.  
 passivation of, by alcohols, A., 1209.  
 precipitation of, by ammonia, A., 919.  
 incandescent, reactions of, with gases, A., 823.  
 Tantalum alloys, non-ferrous, (P.), B., 731.  
 with molybdenum and chromium, (P.), B., 989.  
 with nickel, manufacture of, (P.), B., 989.  
 Tantalum salts, polarographic studies with, A., 1093.  
 Tantalum boride, alloys of nickel and, (P.), B., 1037.  
 carbide, alloys containing, (P.), B., 731.  
 oxide, production of, from its ores, (P.), B., 103.  
 Tantalates, crystal structure of, A., 1192.  
 Tantalum organic compounds:—  
 Tantalates, complex, A., 484.  
 Tantalotartaric acid, A., 366.  
 Tantalum determination:—  
 analysis of, A., 36, 356, 591, 1012.  
 determination of, by cathode-ray method, A., 356.  
 Tapioca meal, microscopical examination of, B., 1102.  
 Tar, apparatus for production and distillation of, (P.), B., 1018.  
 recovery of, in destructive distillation of wood, (P.), B., 875.  
 treatment of, with liquid ammonia, (P.), B., 538.  
 coking of, (P.), B., 1113.  
 distillation of, (P.), B., 410, 538.  
 with production of pitches, (P.), B., 587.  
 distillation and cracking of, (P.), B., 922.  
 corrosion of stills for, B., 665.  
 filtration of, (P.), B., 538.  
 hydrogenation of, (P.), B., 55, 491.  
 viscosity of, B., 87, 134.  
 manufacture of emulsions of, (P.), B., 171.  
 sulphur in, B., 665.  
 use of, on roads, B., 727.  
 separation of phenols from, (P.), B., 9.  
 removal of, from fuel gas, (P.), B., 668.  
 retorts for treatment of materials containing, (P.), B., 829.  
 for linings of converters in steel works, B., 535.  
 brown-coal, thermal behaviour of neutral oil from, B., 967.  
 coal, B., 216.  
 formation of constituents of, B., 168.  
 purification of, (P.), B., 1067.  
 distillation of, B., 489.  
 by hot gases in coke ovens, B., 759.  
 hydrogenation of, B., 456.  
 in low-temperature carbonisation, B., 665.  
 determination of viscosity of, B., 1015.  
 higher fractions of heavy oil from, A., 1121.  
 separation of phenols from, (P.), B., 538, 829.  
 isolation of *s*-xylene from, B., 825.  
 use of, for surfacing roads, B., 134.  
 primary, stabilising action of petrol on hydrogenation products of, B., 328.  
 determination of hydrocarbons neutral oil from, B., 134.  
 from Don basin coal, phenols in, B., 87.

- Tar, low-temperature, manufacture of, (P.), B., 55.  
 pressure-hydrogenation of, B., 967.  
 chemistry of, B., 408.  
 thermal decomposition of constituents of, B., 168.  
 hydrogenation of products from, B., 408.  
 from bituminous coal, separation of neutral and acid constituents of, B., 535.  
 lignite, acids from, B., 665.  
 peat, treatment of, B., 7.  
 light neutral oils of, B., 919.  
 phenolic, preparation of hydrocarbons from, B., 87.  
 production of hydrocarbons from, by catalytic hydrogenation, B., 665.  
 pine, pitch-like product from, for rubber, etc., (P.), B., 1067.  
 pine-wood, phenol and guaiacol in, B., 972.  
 primary, from Chelyabinsk coal, pyrogenic decomposition of paraffin oil from, B., 87.  
 road, analysis of mixtures of asphalt, bitumen and, B., 263.  
 soda-treated, from petroleum, conversion of, (P.), B., 922.  
 wood, Bhadravati, B., 872.  
 determination of, in mixtures containing resins, pitch rubber, or gutta-percha, B., 872.  
 determination of, in ammoniacal liquors, B., 872.
- Tar acids, recovery of, (P.), B., 538.  
 from gas liquors, etc., (P.), B., 1067.  
 removal of sulphur from, B., 586.  
 hydrogenation of, (P.), B., 634.
- Tar oils, distillation and cracking of, (P.), B., 922.  
 hydrogenation of, B., 1015.  
 in presence of sodium hydride and at high pressures, B., 1111.  
 sulphur in, B., 665.  
 extraction of phenols from, with ammonia, B., 408.  
 removal of tar acids from, (P.), B., 538, 589.  
 fungicidal properties of, B., 39.
- Taraxanthin, A., 976.
- Tarbagán, fat from, B., 354.
- Tartaric acid, manufacture of, from carbohydrates, (P.), B., 1101.  
 and its salts, influence of thorium salts on rotation of, A., 323.  
 osmosis in systems of, with water, A., 691.  
 and its derivatives, equilibria of, with malic acid and its derivatives, A., 340, 469, 810.  
 salts, crystal structure of, A., 451.  
 determination of, in wines, B., 814.  
 chromium salt, circular dichroism of solutions of, A., 111.  
 cobalt sodium salt, A., 709.  
 cocaine ephedrine and methyl ephedrine salts, crystal structure of, A., 451.  
 lanthanum salt, complex formation in alkali solutions of, A., 228.  
 potassium ammonium and sodium salts, electrical properties of mixed crystals of, A., 560.  
 sodium salt, peptisation of ferric hydroxide, by, A., 19.  
 sodium ammonium and rubidium salts, optical properties of, A., 561.  
 sodium potassium salt, piezoelectric properties of crystals of, A., 219.  
 dimethyl ester, velocities of crystallisation of, A., 22.
- Tartaric acid, methyl esters, stereoisomeric, polymorphism of, A., 721.  
*p*-phenylphenacyl ester, A., 745.  
 complex compounds of, with trivalent metals, A., 31.  
 determination of, in musts and wines, B., 1133.
- d*-Tartaric acid hydrates, A., 1019.
- l*-Tartaric acid, ammonium salt, preparation of, A., 833.
- d*- and *l*-Tartaric acids, equilibria of, with *d*-phenylglycolic acid, A., 1205.
- Tartrazine, determination of, in dyes, A., 139.
- Taste, relation between constitution and, A., 425.  
 deficiency of, A., 774.
- Taurine, as substitute for cystine in nutrition, A., 422.
- Taurocholic acid, guaiacol ester, A., 419.
- Tautomeric compounds, infra-red spectra and structure of, A., 558.
- Tautomerism, ketimine-enamine, A., 49.  
 keto-enol, as example of polymorphism, A., 695.
- three-carbon, A., 371, 1111.  
 in dicyclic systems, A., 1032.
- Taxin, effect of, on blood-sugar, A., 1163.
- Tea, yield and mineral composition of, B., 697.  
 carotenoids in, A., 1178.  
 moisture in, B., 1103.  
 removal of theine from, (P.), B., 447.  
 firing of, B., 1103.  
 absorption spectrum of, B., 1134.  
 preservation of infusions of, (P.), B., 447.
- black, testing of liquid content of withered tea leaf in manufacture of, (P.), B., 622.
- green, carotene and dihydroergosterol in, A., 437.
- Paraguayan, fermentation product from, (P.), B., 240.
- Tchakva, B., 205.
- determination in, of caffeine, B., 367.  
 of tannin, B., 46.
- Tea plants, green manuring of, B., 278.
- Teak, flaking of varnishes from, B., 517.
- Tectoquinone, A., 784.
- Teeth, structure of enamel of, A., 1275.  
 effect of avitaminosis-*A* and -*B* on, A., 1293.  
 human, age changes in inorganic constituents of, A., 1055.  
 analysis of, affected by pyorrhœa and dental caries, A., 1278.
- Telegraphic pictures, chemical receivers for, (P.), B., 115.
- Teleosts. See under Fish.
- Telephones, finishes for, B., 314.
- Tellurium, B., 845.  
 atomic weight of, A., 442, 980.  
 isotopes of, A., 790.  
 absorption spectrum of, A., 551.  
 arc spectrum of, A., 1183.  
 fluorescence spectrum of, A., 103.  
 resonance series spectrum of, A., 439.  
 vapour, fluorescence of, in the cadmium arc, A., 551.  
 fungicidal action of sulphur, selenium, and, B., 1048.
- Tellurium alloys with mercury, Hall effect in, A., 15.
- Tellurium bromides, density and dissociation of vapours of, A., 328.
- hexafluoride, physical properties of, A., 905.  
 hydride, physical properties of, A., 454.
- Tellurium organic compounds:—  
 Tellurium di-2-thienyl methiodide, A., 762.  
 sulphide, compound of, with piperazine, A., 952.
- Tellurium determination:—  
 determination of, A., 1010.  
 in materials from electrolytic copper plant, B., 987.
- Temperature, absolute and platinum scales of, A., 453.  
 ordinary and thermodynamic scales of, A., 905.  
 determination of, double potentiometer for, A., 137.  
 electrically, B., 51.  
 optical measurement of, B., 819.  
 thermoelectric measurement of, up to 2000°, B., 1124.  
 electrical indication and control of, (P.), B., 232, 611.  
 control of, devices for, (P.), B., 628, 756.  
 in furnaces, etc., (P.), B., 755.  
 with photo-electric cells, B., 1037.  
 automatic control of, (P.), B., 454.  
 of animals, effect of, on glutathione in tissues, A., 1164.  
 high, measurement of, A., 38.  
 with thermocouples, B., 266.  
 control of, with photo-electric pyrometers, B., 291.  
 furnaces and tools for use at, B., 291.  
 low, experiments on, A., 713.  
 effect of, on metabolism, A., 1058.
- Tenebrio molitor*. See Mealworms.
- Tennis courts, materials for, (P.), B., 602.
- Tents, oil damage to cotton materials for, B., 418.
- Tephrosia macropoda*, insecticidal properties of, B., 698.
- Tephrosia vogelii*, constituents of, A., 751.  
 toxic constituents of, A., 888.
- Tephrosic acid, A., 950.
- Tephrosin, structure of, A., 950.  
 constitution of, A., 751.
- Tephrosincarboxylic acid, and its acetyl derivative, A., 950.
- Terebenthenes, vapour pressure of mixtures of colophony and, B., 851.
- Terephthalic acid 2-arsenoxide, A., 180.
- Terminalia catappa*, Philippine talisay oil from seeds of, B., 805.
- Termobacterium mobile*, reactions of, A., 778.  
 decomposition of sugars by, A., 195.  
 production of acetoin by, A., 651.
- Terpenes, A., 62.  
 configuration of, A., 43.  
 syntheses of, from isoprene, A., 856.  
 theory of photosynthesis of, A., 61.  
 recovery of, by distillation, (P.), B., 777.  
 Raman effect in, A., 320, 1076.  
 Raman spectra of, and their derivatives, A., 897.  
 sulphur compounds of, A., 1038.  
 dicyclic, Raman spectra of, A., 7.  
 turpentine, from *Pinus sylvestris*, isomerisation of, A., 517.
- Terpene alcohols, cyclic, action of sulphur on, A., 1038.
- Terpene compounds, Raman effect in, A., 7.  
 higher, A., 166, 277, 517.
- $\alpha$ -Terpenyl acetate, A., 165.
- Terpin hydrate, physico-chemical properties of, A., 619.
- Terpineols, separation of, A., 61.
- $\alpha$ -Terpineolhydroxylamine oxime, benzene-azo-derivative, and its copper salt, A., 750.

- Terra-cotta, properties of, B., 1031.  
chromium green stains for, B., 1031.  
metallised, B., 23.
- Testicles, bromine content of, A., 958.  
active substances in, A., 655.  
dual endocrine activity of, A., 971.  
hormone from, A., 781.
- Tetanus, precipitation between toxin and  
antitoxin of, A., 430.  
metabolism in, A., 1159.  
effect of calcium and phosphorus in diet  
on, A., 642.  
infantile, effect of ammonium chloride  
on metabolism in, A., 1159.
- 4:5:4':5'-Tetra-acetobiadecedione, A., 854.  
2:3:11:12-Tetra-acetoxydibenzodihydro-  
pyrrocoline, A., 527.  
2:3:11:12-Tetra-acetoxydibenzotetrahydro-  
pyrrocoline, A., 527.  
Tetra-acetyl-N-alanylglucosamine, A., 837.  
Tetra-acetyl-N-( $\alpha$ - $\alpha$ -bromopropionamido-  
propionyl)glucosamine, A., 837.  
Tetra-acetylcorytuberoline, salts of, A.,  
1047.  
Tetra-acetylgluconic acid hydrate, A., 44.  
Tetra-acetyl-D-glucose amyl- and  $\beta$ -chloro-  
ethyl-urethanes and L-carbimides, A.,  
1021.  
Tetra-acetyl- $\beta$ -D-glucosidoxyacetic acid,  
ethyl ester, action of titanium tetra-  
chloride on, A., 1115.  
5-O-Tetra-acetyl- $\beta$ -glucosidoxyflavylum  
chloride, 3:7:4'- $\beta$ -hydroxy-, A., 1141.  
4-Tetra-acetyl- $\beta$ -glucosidylacetophenone,  $\omega$ -  
hydroxy-, A., 859.  
4-Tetra-acetyl- $\beta$ -glucosidyl-2-benzoylphloro-  
glucinaldehydes, and their derivatives,  
A., 859.  
6-Tetra-acetyl- $\beta$ -glucosidyl-2:4-OO'-dibenz-  
oylphloroglucinaldehyde, A., 859.  
2-O-Tetra-acetyl- $\beta$ -glucosidylphloroglucin-  
aldehyde, A., 1141.  
Tetra-acetylgyrophoric acid, and its methyl  
ester, A., 1258.  
Tetra-acetyl- $\alpha$ -mannitol  $\alpha$ -dibenzoate, A.,  
929.  
3:3':5:5'-Tetra-acetylmercuridiphenyl, 2:2'-  
dihydroxy-, A., 410.  
 $\beta$ -Tetra-acetyl-3-methyl-D-glucose, A., 255.  
Tetra-acetylquinic acid, derivatives of, A.,  
850.  
Tetra-acetylsarcosine, ethyl ester glucoside  
hydrochloride, A., 605.  
Tetra-acetylsarcosylglycine, ethyl ester  
glucoside, A., 605.  
Tetra-(D-alanyl)-D-alanine, A., 503.  
Tetra-L-alanyl-L-alanine, A., 194.  
7:7-pp'-Tetra-alkyldiaminodiphenylace-  
naphthenes, reduction and autoxidation  
products of, A., 1250.  
Tetra-allyl pentaerythrityl thioether, A.,  
363.  
Tetraisoamylammonium iodide, reaction  
of, with sodium ethyl in zinc diethyl  
solution, A., 243.  
 $\alpha$ -Tetra-amylose, A., 1021.  
O-Tetrazobenzoyl-laudanosoline, salts of, A.,  
527.  
 $\beta$ -Tetra-benzoyl-D-mannitol  $\alpha$ -iodo-  
hydrin, and its derivatives, A., 929.  
2:3:11:12-Tetrazobenzoyloxydibenzotetra-  
hydropyrrocoline, A., 1047.  
O-Tetrazobenzoylpapaveroline, A., 527.  
2:3:5:6-Tetrazobenzoylpyridine, A., 402.  
Tetrazobenzyl pentaerythrityl thioether, A.,  
363.  
Tetrazobutyl pentaerythrityl thioethers, A.,  
363.  
 $\gamma$ -Tetrazobenzoyl-Tetracarbethoxydipropyl ether, A.,  
950.
- s-Tetra-(5-carbethoxy-4-methyl-3- $\beta$ -carboxy-  
ethyl-2-pyrryl)ethane, and its tetra-  
ethyl ester, A., 285.  
s-Tetra-(5-carbethoxymethylethylpyrryl)-  
ethanes, A., 285.  
Tetradeca-acetylstachyose, A., 1116.  
Tetradecabenzoylstachyose, *tetradecanito*-,  
A., 1116.  
Tetradecahydroperylene, A., 507.  
Tetradecamethylmaltotetraose, A., 501.  
Tetradecamethylstachyose, A., 1116.  
Tetradecane- $\alpha$ -diol, formation of oxido-  
tetradecane from, A., 598.  
n-Tetradecanol, iodide of, A., 720.  
Tetradecylmalonic acid, ethyl ester, A., 720.  
Tetra-(3:5-dimethyl-4-ethyl-2-pyrryl)ethyl-  
ene, A., 285.  
Tetraethyl pyrophosphite, A., 364.  
7:7-pp'-Tetraethyldiaminodiphenylace-  
naphthen-3-ol, A., 1250.  
7:7-pp'-Tetraethyldiaminodiphenylace-  
naphthen-8-one, A., 1250.  
7:7-pp'-Tetraethyldiaminodiphenyl-8-alde-  
hyde-1-naphthylethyl, A., 1250.  
Tetraethylammonium halides, solubilities  
of, in various solvents, A., 457.  
iodide, kinetics of formation of, A., 232.  
Tetraethylarsonium antimonyl d-tartrate,  
A., 866.  
Tetraethylphosphonium antimonyl d-tar-  
trate, A., 866.  
1:1:4:4-Tetraethylpiperazinium salts, A.,  
1042.  
Tetraethylsilane, solubility of, in various  
solvents, A., 457.  
1:4:5:8-Tetraethyl-2:3:6:7-tetra-( $\beta$ -dicarb-  
oxy)ethylporphin, salts and octamethyl  
ester of, A., 864.  
 $\alpha\alpha\beta\beta$ -Tetracyclohexylethane, A., 608.  
Tetrahydroabietic acid, derivatives of, A.,  
1036.  
Tetrahydroacetylartemisin, and its oxime,  
A., 271.  
Tetrahydroartemionic acid, A., 271.  
Tetrahydroartemisins, and their derivatives,  
A., 271.  
Tetrahydrobenzofurazan, *tetrabromo*-, and  
its oxides, A., 175.  
Tetrahydrobithiawanol, and its derivatives,  
A., 102.  
Tetrahydrocarbazole, reaction between acyl  
derivatives of, and bromine, A., 169.  
2:3:4:11-Tetrahydrocarbazole, 11-hydroxy-,  
and its benzoyl derivative, A., 168.  
Tetrahydrocystine, A., 1147.  
Tetrahydrodeoxycodine, and its deriv-  
atives, A., 408.  
Tetrahydroelomonic acid, A., 397.  
5:6:7:8-Tetrahydrofluoranthene, derivatives  
of, A., 848.  
5:6:7:8-Tetrahydrofluoranthene-12-carbox-  
ylic acid, A., 847.  
Tetrahydrofuran, oxygen valency angle  
and electric moment of, A., 1190.  
Tetrahydrofurfurylphenylmethane, use of  
toluene-p-sulphonyl chloride in prepara-  
tion of, A., 620.  
Tetrahydrofuryl alcohol, production of,  
from furfuraldehyde, (P.), B., 1019.  
Tetrahydro- $\alpha$ -furylamine, reaction of, with  
nitrous acid, A., 400.  
 $\gamma$ -Tetrahydro-2-furylbutyric acid, A., 279.  
 $\gamma$ -Tetrahydro-2-furylpropyl chloride, and  
its conversion into a Grignard reagent,  
A., 279.  
dl-Tetrahydrogeranic acid, p-toluidide of,  
A., 144.  
Tetrahydrohemicytisylenes, and its deriv-  
atives, A., 1146.  
Tetrahydrohaccol, and its derivatives, A., 943.
- Tetrahydromethylstrychnidine, A., 629.  
Tetrahydromethylstrychnine, A., 629.  
Tetrahydronaphthacarbazoles, 5-bromo-, A.,  
1039.  
8:9:10:11-Tetrahydro- $\alpha$ ' $\beta$ '-naphthacarb-  
azole-7-carboxylic acid, and 5-bromo-,  
ethyl esters, A., 1039.  
Tetrahydronaphthalene (*tetralin*), formation  
of, from naphthalene, A., 730.  
incomplete combustion of, B., 715.  
catalytic dehalogenation of, and 1-  
iodo-, A., 261.  
action of, on rubber, B., 519.  
ar-Tetrahydronaphthalenes, iodonitro-, A.,  
152.  
Tetrahydronaphtho- $\alpha$ -pyrone, A., 64.  
Tetrahydronaphtho- $\alpha$ -pyrone- $\gamma$ -acetic acid,  
A., 64.  
Tetrahydronitrogen *tetrasulphide*, crystal  
structure of, A., 797.  
Tetrahydronormangostin, and its hydro-  
bromide, A., 855.  
Tetrahydro-oxazole, formation of deriv-  
atives of, by action of acetone on  
amides of  $\alpha$ -hydroxy-acids, A., 864.  
1:2:3:6-Tetrahydrophthalic acid, 4-chloro-,  
B., 156.  
Tetrahydropyran, oxygen valency angle  
and electric moment of, A., 1190.  
Tetrahydropyrones, isomerism of, A., 620.  
so-called, constitution of, A., 272.  
Tetrahydroquinolines, amino-, A., 1261.  
Tetrahydroretene, A., 612.  
Tetrahydrostrychnine, bromination and  
oxidation of, and dibromo-, and its  
salts and derivatives, A., 407.  
salts, A., 407.  
derivatives, A., 629.  
Tetrahydrostrychnine, A., 527.  
salts, A., 407.  
Tetrahydro- $\beta$ -tricyclopentadiene, A., 939.  
Tetrahydrotubaic acid, and its derivatives,  
A., 165, 400.  
constitution of, A., 860.  
acetyl derivatives of, A., 739.  
Tetrahydrotubanol, A., 739.  
Tetraketopyrazopyrazoles, alkylated, from  
condensation of alkylmalonic esters  
with hydrazine, A., 1143.  
Tetralin. See Tetrahydronaphthalene.  
2:3:4:6-Tetramethoxybenzaniol, and its  
aldehyde, A., 388.  
1:2:3:5-Tetramethoxybenzene, derivatives  
of, A., 53.  
3:4:3':4'-Tetramethoxybenzil, 5:5'-dibromo-,  
and its p-bromophenylhydrazine, A., 513.  
Tetramethoxybenzoic acid, A., 53.  
2:3:4':5'-Tetramethoxybenzoylacetophen-  
one, A., 621.  
2:3:4:6-Tetramethoxybenzoylformic acid,  
and its aniline salt, A., 388.  
5:6:3':4'-Tetramethoxy-1-benzyl-2-methyl-  
tetrahydroisoquinolines, amino-, di-  
picrolonates, A., 69.  
2:3:11:12-Tetramethoxydibenzodihydro-  
pyrrocoline, A., 527.  
1:18:3:19-Tetramethoxy-6:9-dihydro-5:22-  
dihydroxyacridinolone, A., 754.  
3:4:3':4'-Tetramethoxy-6:6'-dimethylchalc-  
one, A., 388.  
5:6:5':6'-Tetramethoxydiphenyls, di-, tetra-,  
and penta-nitro-, A., 385.  
5:6:5':6'-Tetramethoxydiphenyl-2:3:2':3'-bis-  
phenanthraphenazine, A., 385.  
 $\alpha\beta$ -2:4:2':4'-Tetramethoxydiphenyl- $\alpha\beta$ -di-  
phenylethylene glycol, A., 391.  
3:4:3':4'-Tetramethoxy-8'-ethyl- $\alpha\beta$ -diphenyl-  
ethane, and its chloroaurate, A., 527.  
Tetramethoxyflavone, and 7-hydroxy-, and  
its acetyl derivative, A., 621.



3:3':4':5'-Tetramethoxyflavonol, A., 1256.  
 2:3:11:12-Tetramethoxy-8-methyldibenzo-tetrahydropyrrocolinium iodide, A., 527. methosulphate, A., 1047.  
 6:7:3':4'-Tetramethoxy-1- $\beta$ -phenylethyl-3:4-dihydroisoquinoline, and its salts, A., 1262.  
 6:7:3':4'-Tetramethoxy-1- $\beta$ -phenylethyl-2-methyl-1:2:3:4-tetrahydroisoquinoline, and its picrate, A., 1262.  
 3:4:3':4'-Tetramethoxytriphenylmethane, A., 391.  
 Tetramethyl pentaerythrityl thioether, A., 363.  
 2:2'-Tetramethyldiaminodiphenyl methiodide, resolution of, A., 1125.  
 7:7-*pp'*-Tetramethyldiaminodiphenyl-acenaphthen-8-ol, A., 1250.  
*pp'*-Tetramethyldiaminodiphenyl-8-aldehydro-1-naphthylcarbinol, A., 1250.  
 7:7-*pp'*-Tetramethyldiaminodiphenyl-8-aldehydro-1-naphthylmethyl, A., 1250.  
*pp'*-Tetramethyldiaminodiphenyl-4-diphenylcarbinol, A., 1028.  
*pp'*-Tetramethyldiaminodiphenyl-4-diphenylmethane, A., 1028.  
 Tetramethylarsonium salts, A., 728.  
 3:4:5:3'-Tetramethyl-4'- $\beta$ -carbethoxyethylpyrrolmethene hydrobromide, A., 174.  
 Tetramethyldianthrone, A., 1241.  
 2:3:2':3'-Tetramethyldianthryl, A., 1241.  
 $\alpha$ -Tetramethyldiarsinopentane, A., 528.  
 3:3:3':3'-Tetramethyl-1:1'-diethylindodicarbocyanine, 10-chloro-, salts of, A., 283.  
 1:2:2:4-Tetramethyldihydroquinoline, A., 1142.  
 2:2:4:6-Tetramethyldihydroquinoline, A., 1142.  
 2:2':6:6'-Tetramethyl-8:8'-dinaphthylmethane, 7:7'-dihydroxy-, A., 261.  
 Tetramethyldiphenyl sulphoxides, A., 507.  
 5:7:5':7'-Tetramethyl-8:8'-diquinolyl, A., 625.  
 Tetramethyleneammonium trithiocarbonate, A., 68.  
 3:4-Tetramethyleneanthraquinone, 2-chloro-, A., 1232.  
 $\gamma$ -Tetramethylene- $\Delta^{\alpha\gamma}$ -butadiene,  $\beta$ -chloro-. See 1-Vinyl- $\Delta^1$ -cyclohexene,  $\alpha$ -chloro-.  
 Tetramethylenediamine, additive compound of, with cellulose, A., 149.  
 3:4-Tetramethylene-1:4:11:12-tetrahydroanthraquinone, 2-chloro-, A., 1232.  
 2:3:5:6-Tetramethyl- $\beta$ -ethylglucofuranoside, A., 1021.  
 2:3:5:6-Tetramethylglucofuranose, A., 1021.  
 Tetramethylglucose, acetyl derivative, and 1-bromo-, A., 1237.  
 Tetramethylhaematoporphyrin III, A., 173.  
 $\beta$ - $\gamma$ -Tetramethylhexadecane- $\alpha\pi$ -dialdehyde, A., 1234.  
 $\beta$ - $\lambda$ -Tetramethylhexadecane- $\alpha\pi$ -dicarboxylic acid, A., 1234.  
 Tetramethylmethane, crystal structure and configuration of derivatives of, A., 564.  
 2:3:5:6-Tetramethyl- $\alpha$ -methylglucofuranoside, A., 1021.  
 2:2:5:5-Tetramethylpiperazine dihydrochloride, A., 256.  
 Tetramethylpiperazines, and their salts, A., 625.  
 2:3:5:6-Tetramethylpiperazines, stereoisomeric, A., 754.  
 1:1:4:4-Tetramethylpiperazinium salts, A., 1042.  
 2:3:5:6-Tetramethylpyrazine methiodide, reduction products of, A., 754.  
 4:5:4':5'-Tetramethylpyromethene hydrobromide, and its derivatives, A., 173.  
 2:4:2':4'-Tetramethylthioltriphenylcarbinol, A., 1027.

Tetramethyltriethylporphinpropionic acid, methyl ester, A., 173.  
 2:5:2':5'-Tetramethyltriphenylmethane-4:4'-disazobis-3:6-disulpho- $\beta$ -naphthyl sodium disulphite, A., 610.  
 Tetramethyl-*m*-xylylenediamine, and its picrate, A., 262.  
 Tetramminoplatinous chloride. See under Platinum.  
 Tetrandrine, constitution of, and its derivatives, A., 1048.  
 $\alpha$ -Tetrandrinemethylmethine, derivatives of, A., 1048.  
*Tetranychus telarius*, toxicity of vapours of volatile organic compounds to, B., 1130.  
 Tetracyclopentadiene, additive compound of, with phenyl azoimide, A., 939.  
 Tetraphenyl pentaerythrityl thioether, A., 363.  
 $\alpha\alpha\delta\delta$ -Tetra(phenylacetylenyl)butane- $\alpha\delta$ -diol, A., 447.  
 $\alpha\alpha\delta\delta$ -Tetraphenylbutadiene, A., 496.  
 $\alpha\alpha\delta\delta$ -Tetraphenyl- $\Delta^{\beta}$ -butene- $\alpha\delta$ -diol, action of bromine on, A., 517.  
 Tetraphenyldi-*tert*-butylethynylethane, A., 50.  
 re-arrangement of, and its derivatives, A., 505.  
 2:3:5:5-Tetraphenyl-2:5-dihydrofuran, 2-hydroxy-, A., 518.  
 Tetraphenyldioxadien, A., 63.  
 Tetraphenyldioxin. See Tetraphenyldioxadien.  
 Tetraphenylethylene, preparation of, in liquid ammonia, A., 1122.  
 2:3:5:6-Tetraphenylcyclohexane-1:4-dione, A., 273.  
 1:1:2:3-Tetraphenylindene, A., 1024.  
 Tetraphenylmethane, preparation of, in liquid ammonia, A., 1122.  
 Tetraphenylmethane, *p*-bromo-, and *p*-chloro-, A., 1240.  
 $\beta\beta\beta'\beta'$ -Tetraphenyl- $\alpha$ -methyldiethyl ether,  $\beta\beta$ -dihydroxy-, A., 363.  
 $\alpha\beta\beta\gamma$ -Tetraphenylpropane, A., 838.  
 1:2:3:4-Tetraphenylpyrazopyrrolid-6-one, A., 171.  
 Tetraphenylsilicane, tetra-*m*-nitro-, A., 1050.  
 Tetraphenylsuccinonitrile, isomerisation of, A., 740.  
 2:3:5:5-Tetraphenyltetrahydrofuran, 2:3:4-tribromo-, 4-bromo-2:3-dihydroxy-, and 2:3:4-trihydroxy-, and their derivatives, A., 518.  
 4:4:5:5-Tetraphenylthioltrimethylene 1:3-disulphide, A., 372.  
 Tetrapropyl pentaerythrityl thioethers, A., 363.  
 Tetra-*n*-propylphosphonium antimonyl *d*-tartrate, A., 866.  
 $\alpha$ -Tetrapyridinodiquinolinoplatinous chloride, and its plat-salt, A., 1039.  
 Tetrapyridinoplatinous chloride, and its plat-salt, A., 1039.  
 Tetrapyrrylethanes, A., 285.  
 Tetrathiopentone, preparation of, A., 834.  
 Tetraazo-compounds, preparation of, (P.), B., 460.  
*pp'*-Tetrazodiphenyl, complex salts of, A., 155.  
 Tetrazole derivatives, A., 1043.  
 hydrochloride, 1:5-diamino-, A., 172.  
 Tetrazole-5-carboxylic acid, *N*-diethylamide, and its 3-methyl derivative, A., 524.  
 1:2-Tetrazolophthalazine, 4-amino-, and 4-hydroxy-, and their derivatives, and 4-chloro-, A., 1266.  
 Tetryl, crystallisation of, from solvents, (P.), B., 50.

Textiles, wetting and emulsifying agents for use in manufacture of, (P.), B., 671.  
 treatment of, (P.), B., 338.  
 compositions for, (P.), B., 769.  
 prevention of formation of lime and magnesia soaps in baths for, (P.), B., 99.  
 starch and dextrin pastes for, B., 1050.  
 kier treatment of, (P.), B., 19.  
 machines for washing hanks of, (P.), B., 640.  
 application of washing and finishing agents to, B., 144.  
 decolouring material for, (P.), B., 338.  
 calendaring of, (P.), B., 20.  
 dyeing of. See under Dyeing.  
 finishing of, B., 303.  
 synthetic resin products for, (P.), B., 99.  
 fireproofing and waterproofing of, (P.), B., 676.  
 compositions for impregnation and coating of, (P.), B., 1076.  
 sizes for, from maize starch, B., 143.  
 softening treatment of, (P.), B., 226.  
 softening agents for, (P.), B., 463.  
 oils for use in spinning of, B., 560.  
 waterproofing of, (P.), B., 1076.  
 photographic production of coloured designs for, (P.), B., 450.  
 composition for removal of oil stains from, (P.), B., 270.  
 use of sulphonated fatty alcohols with, B., 648.  
 testing of, B., 835.  
 with ultra-violet light, B., 1073.  
 detection of defects in, B., 795.  
 measurement of humidity of raw materials for, (P.), B., 460.  
 dyed, fastness of, to light, B., 596.  
 sulphite faults and sulphur dioxide effects in, B., 639.  
 prevention of bleeding of, on wool, (P.), B., 1117.  
 determination of manganese in, B., 119.  
 Textile fabrics. See under Fabrics.  
 Textile fibres. See under Fibres.  
 Textile materials, production of, (P.), B., 720.  
 treatment and manufacture of, (P.), B., 722.  
 treatment of, with liquids, (P.), B., 304.  
 with wetting agents, (P.), B., 839.  
 treatment of cakes of, centrifugally, with liquids and gases, (P.), B., 141.  
 cleaning of, (P.), B., 223.  
 conditioning of, (P.), B., 226.  
 desizing of, (P.), B., 1117.  
 lubricating and softening treatment of, (P.), B., 1026.  
 singeing of, (P.), B., 1076.  
 transportation and after-treatment of, wound on bobbins, (P.), B., 18.  
 waterproofing of, (P.), B., 722.  
 incorporation of metal compounds in, (P.), B., 979.  
 production of brocade effects on, (P.), B., 722.  
 artificial, production of, (P.), B., 638.  
 production of composite threads from, (P.), B., 463.  
 cellulose, treatment of, (P.), B., 98.  
 hydrolysis and weighting of, (P.), B., 503.  
 lubrication of, (P.), B., 338, 418.  
 raising safe ironing temperature of, (P.), B., 597.  
 crêped, production of, (P.), B., 338.  
 dyed, fastness to light of, B., 380.  
 elastic, manufacture of, (P.), B., 596.  
 rubber-coated, production of, (P.), B., 179.

- Textile materials, unshrinkable, manufacture of, (P.), B., 722.  
 worsted, piece-dyed, faults in, B., 797.  
 Textile yarns. See under Yarns.  
 Thalleioquin reaction, A., 68.  
 Thallie chloride. See under Thallium.  
 Thallium atoms, reflexion of, from sodium chlorido crystals, A., 1185.  
 isotopic constitution and atomic weight of, A., 209.  
 isotope displacements of, A., 668.  
 allotropic transformation of, A., 1193.  
 arc spectrum of, A., 440, 552.  
 Paschen-Back effect in, A., 208.  
 ionised, omission in, A., 315.  
 films, photo-electric properties of, A., 789.  
 thermochemistry of, A., 341.  
 rate of diffusion of, into lead, A., 1195.  
 Thallium alloys with lead, conductivity of, A., 905.  
 superconducting, thermal resistance of, A., 1194.  
 with mercury, free energies of formation and heats of formation of, A., 126.  
 with sodium, crystal structure of, A., 455.  
 Thallium compounds, application of, in organic chemistry, A., 1269.  
 catalytic action of, in destructive hydrogenation, B., 295.  
 Thallium salts, effect of, on soil fertility, A., 550.  
 pharmacology of, A., 1164.  
 experimental rickets with, A., 537.  
 Thallous carbonate as standard in volumetric analysis, A., 241.  
 chloride, action of light on, in presence of ammonia or oxalic acid, A., 1098.  
 solubility of, in presence of cdestin nitrate, A., 802.  
 in solutions of glycine and its salts, A., 457.  
 nitrate, heat capacity and entropy of, A., 685.  
 equilibrium of, with lithium nitrate, A., 574.  
 thioperrhenate, A., 31.  
 sulphate, equilibrium of, with ammonium sulphate and water, A., 1091.  
 Thallie chloride, condensation of benzene with alkyl radicals of esters, in presence of, A., 1240.  
 Thallium organic compounds:—  
 Thallium dialkyl halides, crystal structure of, A., 904.  
 dipropionylmethanes, A., 1269.  
 Thallium detection and determination:—  
 detection of, A., 922.  
 determination of, A., 1223.  
 with hypiodite, A., 589.  
 argentometrically, A., 589.  
 volumetrically, A., 490.  
 in presence of bismuth and lead, A., 589.  
 Thallous salts. See under Thallium.  
 Thammolic acid, constitution of, and its derivatives, A., 275.  
 Thapsaic acid, and its derivatives, A., 931.  
 Thebaine, and its derivatives, pharmacology of, A., 647, 1163.  
 Thebaine, A., 760.  
 l-Thebenoneketone-(7)-furazan, 1-bromo-, A., 1049.  
 Theelin, potency of, A., 971.  
 Theelol, potency of, A., 971.  
 Thelykinin, in urine of women, A., 547.  
 Theobromine, existence and distribution of, in guarana, A., 204.  
 extraction of, (P.), B., 817.  
 Theobromine sodium salicylate, determination of, B., 448.  
 determination of, in diuretic, B., 1136.  
 Theophylline, effect of, on solubility of uric acid and sodium urate, A., 425.  
 ethanolamino, pharmacology of, A., 774.  
 Theophylline-2:3:4:6-tetramethylglucoside, synthesis of, A., 1237.  
 Therapeutic agents, preparation of, from suprarenal glands, (P.), B., 49\*.  
 manufacture of, (P.), B., 1055.  
 Thermal conductivity, theory of, A., 13.  
 unit for, A., 15.  
 of gases in electric and magnetic fields, A., 328.  
 dissociation, A., 1209.  
 of inorganic compounds, A., 468.  
 Thermionic devices, cathodes for, (P.), B., 992.  
 omission and space charge, A., 316.  
 valves. See under Valves.  
 Thermocouples, (P.), B., 1123.  
 measurement of high temperatures with, B., 266.  
 for temperatures up to 2000°, B., 1124.  
 high-temperature, (P.), B., 660.  
 tellurium-bismuth vacuum, A., 357.  
 tungsten-molybdenum, use of, A., 371.  
 vacuum, A., 36, 357.  
 Thermodynamic potential, change of, with pressure, A., 566.  
 transformations, A., 1206.  
 Thermodynamics, system of, A., 997.  
 symbols for, A., 997.  
 laws of, and differentials, A., 812.  
 third law of, A., 125.  
 irreversible processes in, A., 329.  
 and Nernst's theorem, A., 812.  
 applications of, to systems in motion, A., 339.  
 of concentrated solutions, A., 228.  
 of surfaces of solutions, A., 459.  
 adiabatic, of systems of undefined entropy, A., 695.  
 Thermoelectric effect, theory of, A., 1193.  
 in oxide systems, A., 1193.  
 force, absolute scale for, A., 683.  
 at low temperatures, A., 683.  
 Thermo-elements, construction of, by electrodeposition, B., 645.  
 bimetallic, (P.), B., 473.  
 Thermo-junction needle, A., 713.  
 Thermomagnetometer, A., 925.  
 Thermometers, (P.), B., 2.  
 electrical calibration of, A., 1225.  
 illuminators for, (P.), B., 407.  
 gas, determination of fixed points with, A., 905.  
 metal wire, errors from use of, A., 592.  
 platinum resistance, A., 592.  
 vapour-pressure, (P.), B., 2.  
 Thermopiles, measurement of radiant energy by, A., 924.  
 radiation, A., 357.  
 Thermoplastic materials, (P.), B., 119.  
 manufacture of, (P.), B., 948.  
 joining of, (P.), B., 357.  
 moulds for, (P.), B., 154.  
 production of sheets of, (P.), B., 1042.  
 Thermoregulators, A., 245, 357.  
 Thermostats, A., 357; (P.), B., 84, 532, 756.  
 control of, by alternating current, A., 591.  
 with thermionic relay, A., 36.  
 without relays, A., 245.  
 for safety control of furnaces, (P.), B., 459.  
 electric, (P.), B., 992.  
 electrically-heated, (P.), B., 1.  
 Thermostats, Haughton-Hanson, A., 1225.  
 high-precision, A., 591.  
 low-temperature, A., 491, 924.  
 precision aperiodic, A., 1104.  
 tilting, (P.), B., 789.  
 Thiazines, A., 176.  
 Thiazoles, A., 67, 1046.  
 manufacture of, (P.), B., 1114.  
 Thiazole group, chemistry of, A., 405.  
 Thiele's rule, A., 365.  
 Thienone-indopheninedisulphonic acid, and its barium salt, A., 752.  
 $\beta$ -Thienylacryloylacetacetic acid, derivatives of, A., 1259.  
 $\beta$ -Thienylacryloylacetone, A., 1259.  
 2-Thienylboric acid, A., 762.  
 2-(5-Thienyl)methylarsinic acid, 2-5-bromo-. See Methyl-5-bromothiophen-2-arsinic acid.  
 Thilobilianic acid, and its derivatives, A., 1131.  
 Thiocarbamide (*thiourea*), condensation products of, with formaldehyde and carbamide, (P.), B., 807.  
 compounds of bismuth with, A., 114.  
 manufacture of derivatives of, (P.), B., 577.  
 Thiocarbamides, production of, (P.), B., 496.  
 Thiocarbimides (*mustard oils*), toxicity of, to goldfish, A., 964.  
 Thiocyanates, reactions of, with brominated fatty acids, A., 916.  
 therapy with, in hypertension, A., 419.  
 poisoning by. See under Poisoning.  
 aliphatic, insecticidal activity of, B., 479.  
 organic, manufacture of, (P.), B., 459.  
 determination of, in gastric juice, A., 185.  
 Thiocyanic acid, and its salts, hydrolysis of, (P.), B., 21.  
 oxidation of, by permanganate, A., 135.  
 alkali and alkaline-earth salts, preparation of, B., 419.  
 ammonium salt, uses of, B., 1028.  
 synthetic resins from, B., 436.  
 chromium salts, with heavy metals, A., 133, 920.  
 guanidine salt, production of, (P.), B., 1114.  
 iron salts, A., 1009.  
 lead salts, precipitation of, A., 132.  
 potassium salt, plasmolysis with, A., 550.  
 silver salt, solubility of, in aqueous ammonia, A., 457.  
 sols, stability of, A., 1087.  
 equilibria of, with alkali salts, A., 1091.  
 sodium salt, A., 822.  
 pharmacology of, A., 191, 192.  
 esters, toxicity of, to goldfish, A., 964.  
 ethyl ester, effect of, on sulphur metabolism in rabbits, A., 964.  
 in blood, A., 633.  
 Thiocyanogroup, determination of, in organic compounds, A., 1239.  
 Thioindigo dyes, manufacture of, (P.), B., 58, 793.  
 vat, manufacture of, (P.), B., 222, 254, 637, 794, 1073.  
 manufacture of pastes of, (P.), B., 302.  
 containing sulphur, manufacture of, (P.), B., 58.  
 violet, manufacture of, (P.), B., 1021.  
 Thioindigotin dyes, determination of constitution of, by ozone fission, A., 521.  
 Thioindoxyl. See Thionaphthen, 2-hydroxy-.  
 Thiol-acids, formation of, from dithio-acids A., 367, 932.  
 oxidation of, catalytically, A., 1235.

- Thiol-compounds, oxidation of, by hydrogen peroxide, A., 27, 1023.  
organic, manufacture of, (P.), B., 834.
- Thiol groups, detection of, A., 637.  
determination of, in tissues, A., 532.
- Thionaphthen, 2-hydroxy- (*thioindoxyl*), A., 753.
- Thionaphthens, hydroxy-, manufacture of, (P.), B., 58.
- Thionaphthen-6-carboxylic acid, 2-hydroxy-, chlorides, and their carboxylic acids, (P.), B., 253.
- 2-Thionaphthenphenanthreneindigotin, derivatives of, A., 753.
- Thionaphthenquinone 3-phenylmethylhydrazon, action of phenylmethylhydrazine on, A., 721.
- 2-Thion-4:6-diethyl-1:3:5-dithioazine, A., 68.
- 2-Thion-4:6-dimethyl-1:3:5-dithioazine, A., 68.
- Thionitrates, A., 929.
- Thionitrates, A., 599.
- Thionyl chloride. See under Sulphur.
- Thionylacetacetanilide, A., 840.
- Thionylacetacetnaphthylamides, A., 840.
- Thionylacetacet-tolnides, A., 840.
- Thionylacetacetxylylides, A., 840.
- Thionylacetonedicarboxylanilide, A., 840.
- Thionylacetonedicarboxylanaphthylamides, A., 840.
- Thionylacetonedicarboxyltoluidides, A., 840.
- Thionylamines, aromatic, A., 376.
- 2-Thionylaminobenzoyl chloride, 3:5-dichloro-, A., 376.
- 2-Thionylaminotoluene, 3:5-dibromo-, and 3:5-dichloro-, A., 376.
- Thionylaniline, use of, as reagent for acids, A., 867.
- $\alpha$ -Thionylidibutyric acids, A., 499.
- Thioper-rhenates. See under Rhenium.
- Thiophen, dipole moment of, A., 677.  
separation of derivatives of, from mineral oils, B., 297.  
arsenic derivatives, A., 630.  
metallic derivatives, A., 762, 1148.  
toxicity of, A., 425.
- Thiophen, 2-bromo-, preparation of, A., 950.  
2-cyano-, derivatives of, A., 936.
- Thiophen series, A., 752.
- Thiophenamidoacetamidine hydrochloride, A., 936.
- Thiophenamidoacetnitrile, A., 936.
- Thiophen-2-arsenious sesquisulphide, 5-nitro-, A., 630.
- Thiophen-2-arsenious oxide, and 5-bromo-, 5-bromo-4-nitro-, 5-iodo-, 5-iodo-4-nitro-, and 5-nitro-, A., 630.
- Thiophen-2-arsinic acid, 5-bromo-4-nitro-, A., 630.
- Thiophenbromo-*N*-carbethoxymethylindophenine, A., 752.
- Thiophen-*N*-carbethoxymethylindophenine, A., 752.
- Thiophen-*N*-methylindophenine, A., 752.
- Thiophenols. See Phenols, thio-.
- Thiophosphoric acid. See under Phosphorus.
- 5:6-Thiopyranonothiochromanone-7- $\beta$ -thiopropionic acid, A., 1259.
- Thiosulphates. See under Sulphur.
- 2-Thiotolen-bromindophenine, A., 752.
- Thiotropinone, and its derivatives, A., 1147.
- Thioxenbromindophenines, A., 752.
- Thistle, black. See *Cirsium oleraceum*.
- Thixotropy, B., 324.
- and plasticity, B., 627.  
ultrasonic, of gels, A., 693.
- Thomsonite, A., 715.  
crystal structure of, A., 12.
- Thorium, production of, electrolytically, (P.), B., 897.  
gels, thixotropic behaviour of, A., 123.  
production of ductile wire from, (P.), B., 557.
- Thorium compounds, quadrivalent, A., 708.
- Thorium salts, action of, on metabolism, A., 1060.
- Thorium arsenate, phosphate, and molybdate, gelatinisation of, A., 123.  
cerium borides, A., 348.  
hydroxide, influence of non-electrolytes on precipitation of, from nitrate solutions, A., 19.  
nitride, A., 584.  
heat of formation of, A., 998.  
dioxide (*thoria*), production of sols of, (P.), B., 935.  
influence of cerium oxide on catalytic properties of, A., 28.  
activated, effect of heat on, A., 990.  
oxychloride. See Thoryl chloride under Thorium.
- sulphate, equilibrium of, with manganese sulphate and water, A., 1091.
- Thoryl chloride, compounds of, with alkali chlorides, A., 483, 572.
- Thorium separation:—  
separation of, from iron, A., 491.
- Thorium-*B*, preparations of, A., 1218.  
 $\beta$ -rays of, A., 443.  
solubility of, in metals, A., 1186.
- Thorium-*C*,  $\gamma$ -spectrum of, A., 107.  
 $\alpha$ -rays of, A., 442.  
 $\gamma$ -rays associated with  $\alpha$ -particles of, A., 671.
- Thorium-*C'*, velocity of  $\alpha$ -particles from, A., 555.  
long-range  $\alpha$ -particles from, A., 442.
- Thorium-*C''*,  $\beta$ -ray spectrum of, A., 318.  
 $\gamma$ -rays from, A., 556.  
Compton effect of hard  $\gamma$ -rays of, A., 671.
- Thorium-*C+C'*,  $\alpha$ -rays from, A., 5.
- Thorium-*C+C'+C''*, magnetic spectrum of  $\beta$ -rays of, A., 790.
- Thorium-*X*, adsorption of, by ferric hydroxide, A., 689.
- Threads, treatment of, with wax solutions, (P.), B., 931.  
sizing of, (P.), B., 226.  
spinning of, with centrifugal machines, (P.), B., 639.  
artificial, manufacture of, (P.), B., 142, 225, 336, 502, 675, 881, 931.  
by the dry-spinning method, (P.), B., 142.  
by stretch-spinning process, (P.), B., 462.  
from cellulose, (P.), B., 225.  
from cellulose derivatives, (P.), B., 60, 417.  
from protein solutions, (P.), B., 595.  
manufacture and treatment of, (P.), B., 225.  
manufacture and winding of, (P.), B., 883.  
treatment of, with liquids, (P.), B., 225.  
support for treatment of, in cake form, (P.), B., 257.  
spinning of, (P.), B., 417.  
twisting and winding of, (P.), B., 18.  
hollow, manufacture of, (P.), B., 768, 796.  
fine, manufacture of, from cellulose derivatives, (P.), B., 17.  
textile, production of, (P.), B., 595, 639.  
sizing of, (P.), B., 258, 597.
- Threonic acid,  $\gamma$ -bromo-. See Butyric acid,  $\gamma$ -bromo- $\alpha\beta$ -dihydroxy-.
- d*-Threose and its 2:2-diacetate, A., 368.
- Thrips imaginis*, control of, B., 698.
- Thujaketoglycid-dicarboxylic acid, diethyl ester, A., 948.
- $\beta$ -Thujone, synthesis of, and its derivatives, A., 948.
- Thymine glycol. See 4:5-Dihydrothymine, 4:5-dihydroxy-.
- Thymocrescin, A., 1171.  
effect of, on growth, A., 970, 1171.
- Thymol, and its homologues, and chloro-, synthesis of, A., 510.  
methyl ether, bromo-derivative, A., 53.  
detection of, colorimetrically, B., 400.
- Thymol-6-azo-*p*-phenylarsinic acid, and its salts, A., 528.
- Thymonucleic acid, determination of, with fuchsin-sulphurous acid, A., 1154.
- $\alpha$ -Thymonucleic acid, double refraction of, A., 984.
- Thymus, hyperglycæmia from extracts of, A., 1171.
- Thymus-nucleic acid, fission of, by nucleotidase, A., 776.
- Thyroid (*thyroid gland*), standardisation of preparations of, A., 970.  
nutrition and action of, A., 95.  
perfusion of, A., 539.  
influence of altitude on effect of administration of, in dogs, A., 970.  
action of, on blood and serum, A., 432.  
on blood-cholesterol, A., 1068.  
on carbohydrate metabolism, A., 299.  
on carbohydrate metabolism of liver, and its relation to the pituitary, A., 1172.  
relation of, to iron metabolism, A., 1068.  
effect of injection of, on ovary, A., 970.  
effect of removal of, on cholesterol metabolism, A., 1160.  
action of anterior pituitary extracts on, A., 970.  
aluminium in, A., 879.  
bromine and iodine content of, A., 82.  
colloids, bromine, and iodine in, A., 415.  
fate of hormone of, in hyperthyroidectomy, A., 199.  
effect of anterior pituitary extracts on iodine content of, A., 199.  
effect of iodine administration on iodine and thyroxine in, A., 960.  
in young ducks, effect of anterior pituitary hormones on iodine content of, A., 432.  
desiccated, effect of feeding with, on renal weight, A., 422.  
horse's, iodine and thyroxine iodine in, A., 637.  
sheep's, variation in dry weight and iodine content of, A., 1274.  
assay of, A., 1274.  
determination of thyroxine in, A., 432.
- Thyroid extracts, calorogenic action of, in infants, A., 1068.  
effect of blood on action of, in fowls, A., 1292.
- Thyroidectomy, hormono-vagal effect of, A., 781.
- Thyronine, 2-fluoro-. See  $\beta$ -*p*-Phenoxyphenylpropionic acid,  $\alpha$ -amino- $\beta$ -2-fluoro-4-*p*-hydroxy-.
- Thyroxine, synthesis of, A., 611.  
sulphur and water content of liver and brain after injection of, A., 970.  
effect of sugar and insulin on liver-glycogen fall after administration of, A., 199.  
effect of, on arginine metabolism, A., 650.  
on carbohydrate metabolism, A., 961.

- Thyroxine**, effect of, on iodine in the central nervous system, A., 885.  
on serum-lipase, A., 776.  
detection of, in blood of hyperthyroidised dogs, A., 1171.  
determination of, in the thyroid, A., 432.
- Tibia** of new-born infants, calcification of, A., 78.
- Tiglic acid**, *p*-bromophenacyl ester, A., 1249.
- Tiles**, manufacture of, (P.), B., 345, 507, 1033.  
from clay, (P.), B., 938.  
"pinch effect" in crazing of, B., 548.  
artificial weathering of, (P.), B., 642.  
asbestos-cement, colouring of, (P.), B., 148.  
concrete, manufacture of, (P.), B., 26, 679.  
glazed, manufacture of, (P.), B., 727.  
insulating, manufacture of, (P.), B., 601.  
roofing, (P.), B., 642.  
structural, firing of, B., 306.  
wall, buckling of, B., 548.
- Tilletia laevis***. See Wheat smut.
- Tilletia tritici***. See Bunt and Wheat smut.
- Timber**. See Wood.
- Timothy hay**, assimilation of calcium from, A., 1161.
- Tin** in Bolivian minerals, A., 1229.  
production of, from its ores, (P.), B., 190, 513.  
recovery of, from alkaline stannate solutions, (P.), B., 351.  
from materials low in gangue, (P.), B., 389.  
from zinc-distillation residues, (P.), B., 1123.  
smelting of complex residues of, in blast furnaces, B., 1084.  
fusion of white metal residues and, in reverberatory furnaces, B., 187.  
effect of crystal size on physical properties of babbitts of, B., 510.  
cry of, A., 563, 683.  
porosity of coatings of, on steel, B., 605.  
*L*-absorption spectrum of, A., 3.  
resistance of, to high-frequency currents, A., 328.  
electrodeposition of, B., 846.  
electroplating with, bath for, (P.), B., 1088.  
thermo-electric force of, against silver alloys, A., 453.  
atomic heat of, A., 684.  
rate of diffusion of, into lead, A., 1195.  
equilibrium of, with lead, lead chloride, and stannous chloride, A., 1205.  
and its oxide, equilibria of, with carbon oxides, A., 811.  
corrosion of, by inorganic acids, B., 681.  
corrosion phenomena in containers of, B., 230.  
action of potassium cyanate on, A., 239.  
removal of, from antimonial lead and alloys, (P.), B., 471, 1123.  
from columbite, (P.), B., 684.  
from white-metal alloys, (P.), B., 847.  
disinfectants and cleaning agents for utensils of, (P.), B., 322.  
white, allotropy of, A., 330.  
transformation of, into grey tin, B., 892.
- Tin alloys** with aluminium, (P.), B., 311.  
with aluminium and zinc, (P.), B., 847.  
with antimony, copper, and lead, B., 1084.  
effect of aluminium on, B., 1084.  
with antimony and lead, equilibrium of, A., 1082.  
with cadmium, A., 330.
- Tin alloys** with copper, compounds in, B., 844.  
action of, with lime or quartz in oxygen, A., 350.  
with copper and mercury, A., 456.  
with iron and mercury, A., 456.  
with lead, A., 1082.  
recovery of, from white-metal scrap, (P.), B., 1087.  
with nickel, hardening of, (P.), B., 431.  
with platinum, molecular heat and crystal structure of, A., 1195.
- Tin compounds**, recovery of, from waste silk-weighting liquors, (P.), B., 103.  
thermoluminescence of, B., 1030.  
chemotherapy of *Staphylococcus* infections with, A., 90.
- Tin triaminochloride**, nitride, and nitrilochloride, A., 1100.
- Stannous salts**, oxidation of, by oxygen, A., 475.  
Stannous chloride, equilibrium of, with lead, lead chloride, and tin, A., 1205.  
autoxidation of, in air, A., 476.  
nitrate, decomposition of, A., 351.  
sulphate, electrical conductivity of mixtures of sulphuric acid and, A., 475.  
sulphide, thermochemistry of, A., 812.
- Stannic chloride**, molecular structure of, A., 794.  
dipole moment of, A., 793.  
dipole moment and constitution of molecular compounds of, A., 676.  
manufacture of, (P.), B., 678.  
viscosity of mixtures of aromatic hydrocarbons with, A., 117.  
solutions, ageing and flocculation of, A., 692.  
ammonolysis of, A., 1100.  
oxide, adsorbent and catalytic, manufacture of, (P.), B., 340.  
equilibria of water and, A., 122.  
decomposition of, by radium radiation, A., 1212.  
action of hydriodic acid on, A., 1100.  
oxides and sulphides, hydrated, A., 1100.  
sulphide, solubility of, in ammonia and ammonium carbonate, A., 908.
- Stannic acid**, sols, exchange reactions and micelle-structure of, A., 1201.
- Stannates**, catalytic formation of, A., 705.
- Tin organic compounds**: —
- Tin dipyrindine** and diquinoline salts, A., 950.  
sulphide, compound of, with piperazine, A., 952.  
tetra-(*p*-dimethylaminophenyl), A., 1148.  
tetraphenyl, elimination of tin from, A., 1268.
- Tin detection**, determination, and separation: —  
detection of, in glass, B., 1030.  
determination of, volumetrically, with potassium chlorate, A., 1012.  
in alloys and ores, B., 1083.  
and its separation from antimony, A., 591.  
in brass and bronze, B., 149.  
in cassiterite and stannic oxide, A., 591.  
in ferrotungsten and tungsten ores, B., 644.  
spectroscopically, in lead, A., 35.  
in lead alloys, B., 941.  
in tin drosses, B., 149.  
in tin pyrites containing cassiterite, B., 348.  
determination and separation of, A., 712.  
separation of, from niobium and tantalum, A., 36.
- Tin bronze**, corrosion of, by inorganic acids, B., 681.
- Tin foil**, diffusion of mercury in, B., 265.  
diffusion of mercury drops on, A., 906.  
non-metallic films remaining after solution of tin from, A., 238.
- Tin ores**, oxidised, containing copper, froth flotation of, (P.), B., 231.
- Tin-plate**, baths for production of, (P.), B., 431.  
protective coating for cans of, (P.), B., 684.  
use of town gas in works for, B., 583.  
determination in, of lead, B., 606.
- Tinctura Valerianæ ætherea**, determination of ether in, B., 240.
- Tinctures**, preparation and evaluation of, B., 862.  
examination of, with a nephelometer, B., 400.  
Bourquelot loganine test on, B., 656.  
characterisation and evaluation of, by fixation of iodine, B., 622.  
alkaloidal, effect of exposure to sun on, B., 785.  
homeopathic, identification of, B., 785.  
determination in, of alcohol, B., 240.  
of dry residue, B., 750.
- Tissues**, constituents of, A., 957.  
effect of, on circulation, A., 965.  
metabolism in, A., 770.  
respiration of, A., 1281.  
effect of amino-acids on, A., 82, 420, 643.  
influence of chemical composition on, A., 420.  
stainability and potential in, A., 664.  
animal and human, detection and determination of ethyl alcohol in, A., 958.  
blood-free, iron content of, A., 957.  
growing, gaseous metabolism of, A., 1058.  
living, growth of, measurement of, A., 298.  
effect of rays on, A., 302.  
oxidation-reduction potential of, A., 297.  
reversible coagulation in, A., 88, 191, 192, 425.  
recording oxygen intake of, A., 1176.  
rabbits', reduced glutathione in, A., 1156.  
sympathetic nervous, oxidation in, A., 1154.  
tumorous, therapeutically active product from, (P.), B., 449.  
determination in, of heavy elements, A., 416.  
See also Animal tissues.
- Titanite**, A., 533.  
from Monte Rosso di Verra, A., 1106.
- Titanium** in raw phosphates, B., 677.  
infra-red arc spectra of, A., 1188.  
superconductivity of, A., 683.  
oxide layers on, A., 450.
- Titanium alloys** with iron, stainless, (P.), B., 988.
- Titanium compounds**, production of, (P.), B., 341, 724, 886, 935.
- Titanium salts**, polarographic studies with, A., 1093.
- Titanium bromides**, A., 823.  
carbide, lattice constant of, A., 1078.  
alloys containing, (P.), B., 731.  
carbide and nitride, hard alloys of, (P.), B., 311.  
trichloride, A., 31.  
tetrachloride, dipole moment of, A., 793.  
dipole moments and constitution of molecular compounds of, A., 676.  
diamagnetism and structure of, A., 795.

**Titanium tetrachloride**, compound of, with ethyl ether, A., 1008.  
 solutions, ageing and flocculation of, A., 692.  
*tetrahalides*, crystal structure of, A., 325.  
 hydroxide, manufacture of, (P.), B., 1078.  
 iodates, A., 1099.  
 nitride, A., 132.  
*dioxide (titania)*, feeding of sheep on, A., 426.  
 peroxide, A., 483.  
 Titanous sulphate, use of, in volumetric analysis, A., 1011.  
 Fluotitanates, alkali, A., 31, 351.  
**Titanium determination and separation**:—  
 determination of, with 5:7-dibromo-8-hydroxyquinoline, A., 490.  
 as dioxide, A., 491.  
 in alloy steel, B., 1035.  
 spectroscopically, in aluminium, A., 35.  
 in ointments, B., 1054.  
 determination and separation of, A., 712.  
 separation of, A., 1012.  
 by guanidine carbonate, A., 1224.  
 from tantalum and niobium, A., 356.  
**Titanium ores**, treatment of, (P.), B., 1029.  
 containing chromium, (P.), B., 678.  
**Titanomagnetites**, Doeltera, reduction of, B., 941.  
 Ural, utilisation of, B., 941.  
 determination in, of vanadium, A., 712, 1104.  
**Toad**, sympathetic substances from intestine and organs of, A., 95.  
 secretion, basic components of, A., 1142.  
 poisons. See under Poisons.  
**Tobacco**, constituents of, A., 888.  
 quality of, in relation to extractive matter, B., 703.  
 reaction of smoke in relation to, B., 703.  
 improvement of, B., 703.  
 influence of heavy potash manuring on burning properties of, B., 696.  
 treatment of, (P.), B., 704.  
 with moist air, (P.), B., 80.  
 removal of nicotine from, B., 785; (P.), B., 241, 288, 322, 527, 577.  
 curing of, (P.), B., 751.  
 drying and fermentation of, A., 785.  
 fermentation of, (P.), B., 401, 1056.  
 water capacity of, A., 1296.  
 alkaloids of, A., 177.  
 biology of, A., 436.  
 pectic substances in, B., 702.  
 pectin of, A., 202.  
 $p_H$  and buffering in press-juice of, A., 785.  
 cut, storage of, (P.), B., 704.  
 German and Spanish, potassium in, B., 703.  
 precipitin reaction of, in mosaic disease, A., 314.  
 determination in, of ammonia in presence of nicotine, B., 703.  
 of malic, citric, and oxalic acids, B., 703.  
 of nicotine, B., 750.  
 and its removal, B., 287.  
 of potassium, B., 703.  
**Tobacco leaves**, glucosides from, A., 1177.  
**Tobacco plants**, growth of, manganese in Connecticut soils in relation to, B., 522.  
 effect of thallium on, A., 1181.  
 "sand-drown" disease of, in relation to lime and magnesia in soils, B., 569.  
 assimilation of nitrogen by, A., 101.  
 choline in seeds and leaves of, and its detection and determination, A., 978.

*Toluene compounds, Me = 1.*  
**Tobacco-seed oil**, B., 994.  
**Tobacco smoke**, nicotine in, A., 1284; B., 703.  
 removal of, B., 48, 79, 576.  
 during smoking, B., 206, 1103; (P.), B., 207.  
 nitrogenous substances in, B., 703.  
 non-nitrogenous constituents of, A., 202.  
 effect of, on surface tension of water, A., 569.  
 filters for, (P.), B., 1056.  
 effect of, on blood-sugar, A., 1284.  
 cigar, effect of Bonicot injection on nicotine content of, B., 287.  
 determination in, of nicotine, B., 912.  
**Tolane oxide**. See Diphenyloxen.  
**Tolane-2:2'-disulphonic acid**, and 4:4'-dinitro-, salts of, A., 730.  
**Tolazone**, 4:4'-difluoro-, and 4:4'-dinitro-, A., 729.  
**m-Tolualdehyde**, 2:6-dihydroxy-, A., 852.  
**p-Tolualdehyde**, 3:5-dihydroxy-. See Atranol.  
**m-Toluanilide**, A., 384.  
**Toluene**, Raman spectrum of, A., 7, 109.  
 density of, at low temperatures, A., 14.  
 surface tension of, A., 1078.  
 partition of fatty acids between water and, A., 1198.  
 equilibrium of, with alcohol and water, A., 801.  
 with benzene, A., 1083.  
 incomplete combustion of, in presence of catalysts, B., 715.  
 apparatus for chlorination of, (P.), B., 671.  
 thermal vapour-phase chlorination of, A., 152.  
 oxidation of, by oxides of nitrogen, A., 159.  
 catalytic oxidation of, A., 235.  
 photochemical interaction of nitrobenzene and, A., 130.  
 derivatives, nuclear chlorination of, A., 258.  
 determination of water by distillation with, A., 486.  
**Toluene**, 2:4-diamino-, *p*-toluenesulphonyl derivative, A., 375.  
*p*-bromo-, and *p*-chloro-, nitration of, quantitatively, A., 838.  
 chloro-derivatives, manufacture of, (P.), B., 1072.  
*o*-, *m*-, and *p*-chloro-, dipole moments of, A., 9.  
*o*- and *p*-chloro-, molecular rearrangement in hydrolysis of, A., 943.  
*m*-chloro-, reaction of, with acetyl chloride, A., 1133.  
 2-chloro-6-fluoro-, A., 55.  
 chloriodo-derivatives, A., 505.  
 2:4:6-trichloro-3-iodo-, A., 740.  
 2:6-dihydroxy-, derivatives of, A., 852.  
 2:3:5-trihydroxy-, and its tribenzoyl derivative, A., 275.  
*o*-nitro-, bromination of, A., 939.  
 trinitro-, evolution of gas in manufacture of, B., 1009.  
 influence of moist air on decomposition of, B., 752.  
 of high m.p., manufacture of, B., 752.  
*o*-Tolueneazofluorescein, and its diacetyl derivative, A., 1141.  
 3-*p*-Tolueneazo-2:4-dihydroxyquinolines, and nitro-, A., 623.  
*m*-Tolueneazo- $\beta$ -naphthol, *p*-amino-, and its sodium salt, A., 609.  
 and its acetyl derivative, A., 609.  
 3-Toluenehomophthalimides, and nitro-, A., 624.

*Toluene compounds, Me = 1.*  
*p*-Toluenesulphonic acid, formation of salts of, for identification of amines, A., 375.  
 esters, A., 734.  
*o*-amino- $\beta$ -diethoxy- $\alpha$ -2:4-dinitrophenyl-propyl ester, A., 404.  
 benzyl ester, A., 363.  
 cholestanyl, ergostanyl,  $\alpha$ -ergostenyl, and sitostanyl esters, A., 737.  
 6-nitro-*o*-tolyl ester, A., 852.  
*p*-Toluenesulphon-4-nitro-*m*-tolylamide, A., 1124.  
*o*-Toluenesulphonyl chloride,  $\omega$ -chloro-, A., 939.  
*o*- and *p*-Toluenesulphonyl fluorides,  $\omega$ -chloro-,  $\omega$ -hydroxy-, and  $\omega$ -iodo-, A., 939.  
*p*-Toluenesulphonyl chloride, reaction of, with nitrophenols, A., 734.  
*o*-Toluenesulphonyl fluoride, A., 365.  
*o*-*p*-Toluenesulphonyl- $\alpha$ -2:5-dichlorophenylthiolacetone, A., 838.  
*p*-Toluenesulphonyldi(methanesulphonyl)-methane, A., 838.  
 3-*p*-Toluenesulphonyldiisopropylidenequinamide, A., 849.  
*o*-*p*-Toluenesulphonyl- $\alpha$ -ethylthiolacetone, A., 837.  
*p*-Toluenesulphonylmethanesulphonylmethane, A., 837.  
 3-*p*-Toluenesulphonyl-1-methoxy-4:5-*iso*-propylidenequinamide, A., 850.  
 3-*p*-Toluenesulphonyl-1-methoxyquinamide, A., 850.  
 4-*p*-Toluenesulphonyloxybenzoic acid, 3-nitro-, methyl ester, A., 734.  
*p*-Toluenesulphonyloxytoluic acid, 5-nitro-, ethyl ester, A., 734.  
*o*-*p*-Toluenesulphonyl- $\alpha$ -phenylthiolacetone, A., 838.  
 3-*p*-Toluenesulphonyl*iso*propylidenequinamide, A., 849.  
*o*-*p*-Toluenesulphonyl- $\alpha$ -*p*-tolylthiolacetone, A., 838.  
**Toluene-2:4:5-tricarboxylic acid**, A., 1138.  
 and 6-nitro-, and their derivatives, A., 1258.  
*m*-Toluic acid, 4-fluoro-, A., 729.  
*o*-Toluidine, reaction of, with pyruvyl-hydroxamic acid, A., 1025.  
*o*-Toluidine, dithio-, recognition of, as 2:2'-diamino-5:5'-ditolyl sulphide, A., 1244.  
 di- and tri-thio-, A., 943.  
*m*-Toluidine, fluidity of, A., 566.  
 complex salt of, with cuprous chloride, A., 376.  
*p*-Toluidine, surface activity and adsorption of, at liquid-liquid interfaces, A., 992.  
 growth and disappearance of thin crystals of, A., 796.  
 separation of, from *o*-toluidine, (P.), B., 13.  
*p*-Toluidine, 3-*p*-amino-, toluenesulphonyl derivative, A., 1124.  
 Toluidines, *p*-toluenesulphonates of, A., 375.  
 Toluidinobenzhydrylphenylacetylenes, and their hydrochlorides, A., 260.  
 $\beta$ -Toluidinobutyronitriles, A., 375.  
 Toluol. See Cresols.  
*o*-Toluanitrile, dipole moment of, A., 9.  
 conductivity of electrolytes in, A., 699.  
*p*-Toluquinone, oxidation of, electrochemically, A., 60.  
 Toluyl chlorides, action of hydrogen sulphides on, A., 55.  
 1-Toluoyldimethylnaphthalenes, A., 374.  
*o*-Toluoyldiphenylcarbinol, A., 737.  
 3-*p*-Toluoyl-1:2:5-oxadiazole, 4-amino-, benzoyl derivative, A., 1267.

*Toluene compounds, Me=1.*

6-*p*-Toluoyl-2-*p*-tolyl-5:6-dihydro-1:4-pyran, 3-cyano-, A., 63.  
 Toluthionilides, hydroxy-, A., 511.  
 Toly ethers, manufacture of alkyl derivatives of, (P.), B., 878.  
*o*-phenylene phosphates and phosphites, A., 379.  
*o*-Tolyl methyl ether, 3-fluoro-, A., 1247.  
 triphenylmethyl ether, rearrangement of, A., 267.  
*o*- and *p*-Tolyl triphenylmethyl sulphides, A., 1027.  
*m*-Tolyl ethers, intramolecular rearrangement of, A., 510.  
*p*-Tolyl benzyl and propyl ethers, 3-bromo-, 3-chloro-, and 3-nitro-, A., 26.  
 methyl ether, condensation of, with *p*-benzoquinone, A., 396.  
 radical, affinity capacity of, A., 390.  
*β*-Tolylacetone, A., 278.  
*N*-Tolyl-3-acetyl-5-phenyl-2-methylpyrroles, and their derivatives, A., 1063.  
*β*-*o*-Tolylacetaldehyde, A., 616.  
*β*-Tolylallyl bromides, A., 616.  
 2'-Tolylamino-*β*-naphthol, 1:4'-amino-, and its hydrochloride, A., 379.  
 4-*p*-Tolylamino-2-phenyl-6-methylquinoline, synthesis of, and its salts and derivatives, A., 1039.  
*p*-Tolylisoamyl ketone, and its semicarbazone, A., 387.  
*α*-*m*-Tolyl-*β*-2-anthraquinonylene, 4:6-dinitro-, A., 57.  
*p*-Tolylantipyriliminophthalonimide, A., 624.  
*o*-Tolylarsinic acid, compound of, with hydrochloric acid, A., 1049.  
 5-Tolylbenzylamine, 2:4-dinitro-, A., 1124.  
*N*-*p*-Tolyl-4-benzylidenhomophthalimide, A., 624.  
*p*-Tolyl benzyl ketone, and its oxime, A., 390.  
*γ*-*p*-Tolyl-*n*-butyl alcohol, and its bromide, A., 278.  
*O*-*m*-Tolylcarbamide, salts of, A., 610.  
 Toly *p*-chlorobenzyl ketones, A., 158.  
*p*-Tolylchloroxyime, dicarbanil derivative, A., 1146.  
*o*-Tolyl chloromethyl ketone, and its semicarbazone, A., 385.  
*m*-Tolyl trichloromethyl ketone, 6-chloro-, A., 59.  
*γ*-*p*-Tolylisocrotonic acid, A., 948.  
*p*-Tolyleyanamide, and its silver salt, A., 1146.  
*r*-*p*-Tolyldeoxybenzoin, A., 746, 1251.  
 Tolydi-*p*-anisylacetic acids, hydroxy-, and their salts and derivatives, A., 855.  
 Tolydi-*p*-anisylcarbinol, 4-hydroxy-, A., 855.  
*ψ*-Tolydi-*p*-anisylcarbinols, 4-hydroxy-, and their derivatives, A., 855.  
 3-Tolydi-*p*-anisylmethane, 4-hydroxy-, A., 855.  
*p*-Tolyl dianisyl-*p*-tolylmethyl ketone, A., 515.  
*N*-*p*-Tolyl-4:4-diethylhomophthalimide, A., 624.  
 3:2'-Tolyl-1:3-dihydrophthalazine-4-acetic acid, 1-hydroxy-3:4'-nitro-, and its derivatives, A., 404.  
 3:2'-Tolyl-1:3-dihydrophthalazine-1-sulphonic-4-acetic acid, 3:4'-nitro-, sodium hydrogen salt, A., 404.  
*N*-*p*-Tolyl-4-*p*-dimethylaminobenzylidenhomophthalimide, A., 624.  
*γ*-*p*-Tolyl-*α*-*β*-dimethylcrotonic acid, ethyl ester, A., 278.  
*γ*-*p*-Tolyl-*β*-*γ*-dimethylpropyl bromide, A., 278.

*Toluene compounds, Me=1.*

*γ*-*p*-Tolyl-*β*-*γ*-dimethylpropyl bromide, A., 278.  
*p*-Tolyl *p*-diphenyl ketoxime, A., 853.  
 1-*p*-Tolylcyclo-2:5-dithia-3:4-dimethylene-stibine, A., 867.  
 3:4-Tolylenediamine, isomeric 2:4-dinitro-phenyl derivatives of, A., 1124.  
*β*-*p*-Tolylethyl bromide, A., 278.  
*α*-*p*-Tolylethyl methyl ketone, and its derivatives, A., 391.  
*β*-*p*-Tolylethylmethylmalonic acid, and its ethyl ester, A., 278, 603.  
 9-*o*-Tolylfluorene, and amino-, and 9-hydroxy-, and their derivatives, A., 1032.  
 9-*o*-Tolylfluorene, 9-hydroxy-, A., 1024.  
*o*-Tolyl-*β*-*d*-galactoside tetraacetate, and *ω*-bromo-, A., 501.  
*p*-Tolylglycolic acid, ethyl ester, A., 391.  
*p*-Tolylglyoxime, and its derivatives, A., 57.  
*N*-*p*-Tolylhomophthalimide, and oximino-, A., 624.  
*α*-Tolylhydrobenzoin, dehydration of, A., 1251.  
 Tolyhydroxylamines, dicyano-, and their derivatives, A., 377.  
*p*-Tolyl-*β*-hydroxyvinyl ketone, derivatives of, A., 522.  
*p*-Tolylmercaptan, reaction of, with 2-phenyl-4-benzylidene-5-oxazolone, A., 511.  
*p*-Tolyl 2-methyl-1-anthraquinonyl ketone, A., 274.  
 2-*p*-Tolyl-5-methylbenzotriazole-tetrasulphonic acid, A., 264.  
*γ*-*p*-Tolyl-*β*-methylbutan-*α*-ol, A., 278.  
*γ*-*o*-Tolyl-*β*-methyl-*n*-butyl alcohol, A., 278.  
*p*-Tolylmethyl *β*-butyl ketone, and its semicarbazone, A., 387.  
*γ*-*p*-Tolyl-*α*-methylbutyric acid, and its derivatives, A., 603.  
*γ*-*p*-Tolyl-*β*-methyl-*n*-butyric acid, and its chloride, A., 278.  
*β*-*o*-Tolyl-*α*-methylcrotonic acid, ethyl ester, A., 278.  
 9-*p*-Tolyl-2-methyl-8-oxanthrone (10)-1-carboxylic acid lactone, A., 274.  
*γ*-*p*-Tolyl-*α*-methyl-*d*<sup>α</sup>-pentenoic acid, and its ethyl ester, A., 278.  
*β*-*p*-Tolyl-*α*-methylpropaldehyde, and its semicarbazone, A., 272, 391.  
*α*-*p*-Tolyl-*β*-methylpropan-*α*-ol, A., 391.  
*β*-*p*-Tolyl-*α*-methylpropionic acid, *β*-hydroxy-, ethyl ester, A., 278.  
*β*-*p*-Tolyl-*α*-methyl-*n*-propyl alcohol, and its bromide, A., 278.  
*α*-*p*-Tolyl-*β*-methyl-*d*<sup>α</sup>-propylene, and its oxide, A., 391.  
*α*-*p*-Tolyl-*β*-methyl-*α*-*β*-propylene glycol, A., 391.  
*γ*-*p*-Tolyl-*β*-methyl-*α*-*β*-propylene oxide, A., 272.  
*T*-Tolylmethyl *α*-propyl ketone, and its semicarbazone, A., 387.  
 2-*p*-Tolyl-6-methylquinoline-4-carboxylic acid, 3-hydroxy-, A., 754.  
*α*-*p*-Tolyl-*γ*-methylvaleraldehyde, and its semicarbazone, A., 387.  
*γ*-Tolylmethylvaleric acids, and their chlorides, A., 278.  
 1-*o*-Tolyl-naphthalene, A., 1121.  
*α*-Tolyl-*β*-(2-naphthyl)thiocarbamides, *α*-chloro-, A., 154.  
*m*-Tolylidinitromethane, A., 272.  
 3-*p*-Tolyl-1:2:4-oxadiazole, and its acetyl derivative, A., 1267.  
 5-*p*-Tolyl-1:2:4-oxadiazole-3-carboxylic acid, and its silver salt, A., 1146.  
*m*-Tolylloxamic acid, 4-hydroxy-, A., 1244.  
 4-*p*-Tolylxyphenylarsinic acid, A., 1050.

*Toluene compounds, Me=1.*

4-Tolylxyphenylarsinic acids, 3-amino-, and 3-nitro-, A., 1049.  
*p*-Tolyl *β*-phenylstyryl ketone, anil of, A., 260.  
*p*-Tolyl *α*-phenyl-*α*-*p*-tolylethyl ketone, A., 382.  
*α*-5'-Tolylphthalide-3'-carboxylic acid, 4'-hydroxy-, and its derivatives, A., 1031.  
*α*-*p*-Tolyl-*d*<sup>α</sup>-propene-*β*-*γ*-dicarboxylic acid, diethyl ester, A., 948.  
 6-*p*-Tolylpyridine, 2-hydroxy-, A., 522.  
 6-*p*-Tolyl-2-pyridone, 3-cyano-, A., 522.  
 6-*p*-Tolyl-2-pyridone-3-carboxylic acid, A., 522.  
 2-*p*-Tolylpyrrolone, and its picrate, A., 1259.  
 2-*p*-Tolylquinoline-4-carboxylic acid, 3-hydroxy-, A., 754.  
 3:2'-Tolyltetrahydrophthalazine-4-acetic acid, 1-hydroxy-3:4'-amino-, and its acetyl derivative, A., 404.  
*o*-Tolyltetrazolol, 5-thiol-, ammonium salt, A., 405.  
 Tolythiocarbimides, chloro- and nitro-, A., 154.  
*γ*-*p*-Tolylthiol-*αα*-dimethylbutyronitrile, A., 727.  
*β*-*p*-Tolylthiol-*β*-phenylpropionic acid, *α*-amino-, benzoyl derivatives, esters of, A., 511.  
 Toly-*β*-*p*-tolylcarbamides, *α*-chloro-, A., 154.  
*p*-Tolyl *p*-tolylid(diphenyl)methyl ketone, A., 515.  
*N*-*p*-Tolyl-*N*-*o*-tolyl-*N*-methylbenzamidine, and its picrate, A., 1242.  
 Tolyurethanes, and chloro-, and nitro-, A., 154.  
*α*-*p*-Tolyl-*n*-valeraldehyde, and its semicarbazone, A., 387.  
*γ*-*p*-Tolylvaleric acid, and its chloride, A., 278.  
*o*-Tolylvinylcarbinol, A., 616.  
 9-*o*-Tolylxanthhydrol, A., 613.  
*o*-Tolyl-*m*-4-xylylphthalide, A., 270.  
 Tomatoes, catalase in, A., 550.  
 glycolic and oxalic acids in, A., 784.  
 vitamin-A in, A., 309.  
 acidity and colour changes in, during storage, A., 101.  
 ethylene treatment of, B., 79.  
 injury of, by sulphur dioxide, B., 575.  
 home-canned, antiscorbutic vitamin in, A., 434.  
 Tomato juice, growth factor in, A., 434.  
 Tomato plants, influence of aeration on growth of, in solution cultures, B., 856.  
 effect of soil reaction on growth, nitrogen, phosphorus, and manganese content of, B., 158.  
 effect of calcium deficiency on, A., 205.  
 control of leaf mould in, B., 74, 698.  
 Tomato preserves, B., 861.  
 action of heat on, B., 366.  
 determination of total solids in, B., 284.  
 Tomato seeds, control of damping off of, B., 569.  
 dusting of, to prevent damping-off, B., 1130.  
 Tomato-seed oil, B., 1090.  
 Tonsils, calculus of, A., 417.  
 Tools, alloys for, (P.), B., 557.  
 chromium-plated, production of, (P.), B., 943.  
 cutting, iron alloys for, (P.), B., 310.  
 metal aggregates for, (P.), B., 683.  
 Tooth pastes, surface tension of solutions of, B., 1135.  
 use of aluminium, tin, or tinned-lead tubes for, B., 50.  
 Topochemical transformations, A., 822.

- Tormentol in species of *Potentilla*, A., 665.  
 Tornesite, B., 1043.  
 Tourmaline, black, A., 38.  
   Brazilian, spectroscopy of, A., 495.  
 Towers, filling material for, (P.), B., 756.  
   packings for, B., 371.  
   bubbling, (P.), B., 532.  
   trays for, (P.), B., 533.  
   cap for, (P.), B., 533.  
   draining, for coal, etc., (P.), B., 325.  
   self-supporting, foundations for, B., 707.  
 Toxicaric acid, A., 751.  
 Toxicarol, A., 619, 855.  
   structure of, A., 855.  
   constitution of, and its derivatives, A., 751.  
*apo*Toxicarol, and its derivatives, A., 855.  
 Toxicity, A., 206.  
   discs for tests on, A., 102.  
 Toxicology, A., 192.  
 Toxins, A., 1290.  
   relation of copper and iron to production of, A., 430.  
   flocculation of, and anti-toxins, A., 197.  
   bacterial, detoxication of, and their antigenic properties, A., 430.  
 Tracing materials, (P.), B., 336.  
 Transfer sheets, production of, (P.), B., 798.  
 Transference numbers, measurement of, A., 698.  
   limiting law for, A., 342.  
 Transformers, deoxidising material for use in, (P.), B., 935.  
   immersion, gas-exchange system for, (P.), B., 390.  
 Transformer oils, (P.), B., 971.  
   production of, (P.), B., 734.  
   from Rumanian crude oils, B., 872.  
   purification of, (P.), B., 876.  
   deoxidiser for, (P.), B., 590.  
   removal of phosphorus from, (P.), B., 971.  
 Trass, Rhineland, chemistry of, B., 641.  
   Slanic, B., 799.  
 Trees, enzyme content of, during winter, A., 99.  
   effect of illuminating gas on, A., 784.  
   chlorosis of, B., 955.  
   direct injection of, for study of nutrition problems, B., 744.  
   volume of liquid needed for spraying of, B., 571.  
   insecticides for, B., 570.  
   budding and grafting plaster for, (P.), B., 396.  
   forest, importance of lime for, B., 696.  
 Trehalose, formation of, by bottom yeast, A., 1167.  
   fermentation of, A., 428.  
*neo*Trehalose, synthesis of, and its heptaacetate, A., 46.  
 Triacetic acid, derivatives of, A., 748.  
 2:4:5-Triacetoxyanisole, A., 853.  
 3:4:5-Triacetox-2- $\alpha$ -chloropropenylphthalide, A., 848.  
 2:4:4'-Triacetox-3:5:3':5'-tetramethylphenyl, A., 854.  
 Triacetylacetic acid, ethyl ester, A., 931, 1234.  
 Triacetylaloe-emodin, *tetrabromo*-, A., 1252.  
 Triacetyl-9:10-dihydrothebenines, A., 1048.  
 Triacetylglucosaminotrimethylammonium bromide hydrobromide, A., 371.  
 1:4:6-Triacetylglucose 2:3-*dibenzoate*, A., 1115.  
 Triacetyl-lecanoric acid, and its derivatives, A., 1258.  
 Triacetylmercuridiphenylmethane-5:5'-dicarboxylic acid, A., 410.  
 Triacetyl methane, and its salts, A., 933, 1236.  
 1:4:5-Triacetyl-3-methoxyquinic acid, A., 850.  
 Triacetylmethyl halides, A., 933.  
 Triacetyl- $\beta$ -methylgalactoside 6-bromohydrin, A., 369.  
 2:3:4-Triacetyl- $\alpha$ -methylglucoside, methylation of, A., 45.  
 3:4:6-Triacetyl-2-methyl- $\alpha$ -methylglucoside, formation of, from 2:3:4-triacetyl- $\alpha$ -methylglucoside, A., 45.  
 $\gamma$ -Triacetylmethylrhannoside, A., 45.  
 2:3:4-Triacetylisorhamnosidotrimethylammonium bromide, A., 371.  
 Triacetylisothebenine, and 1-bromo-, A., 290, 1049.  
 2:3:4-Triacetyl-6-triphenylmethyl- $\alpha$ -methylgalactoside, A., 1237.  
 2:3:4-Triacetyl- $\beta$ -xylosidotrimethylammonium bromide, A., 371.  
 $\Delta^{1:15}$  (or 16)-*cyclo*Triaccontadiene, A., 58.  
*cyclo*Triaccontane-1:16-diacetic acid, 1:16-dihydroxy-, ethyl ester, A., 58.  
*cyclo*Triaccontane-1:16-diol, A., 58.  
 $\Delta^1$ -*cyclo*Triacconten-16-ol, A., 58.  
 Tri-*l*-alanyl-*l*-alanine, A., 194.  
 Tri-*dl*-alanyl-*dl*-alanine, A., 503.  
 Triallylacetonitrile, A., 727.  
 Triamylamines, fluidities of, A., 566.  
 Triisomylcarbethoxymethylammonium bromide, A., 605.  
 Triisomylcarboxyanilidomethylammonium bromide, A., 605.  
 Triisomylcarboxymethylammonium bromide, A., 605.  
 Triisomyltrimethylenetriamine, and its salts, A., 726.  
 Trianhydrotris*cyclohexylsilicane*diol, A., 1050.  
 Trianhydrotris*cyclohexylphenylsilicane*diol, A., 1050.  
 Trianilinomethane, and its hydrochloride, A., 1025.  
 Tri-*p*-anisylacetic acid, methyl ester, A., 855.  
 Triaryl phosphates, manufacture of, (P.), B., 879.  
   thiophosphates, preparation of, A., 410.  
 Triarylacrylic acids, preparation of, A., 848.  
 Triarylamine series, ring-closure in, A., 846.  
 Triarylcarbinols, hydroxy-, tautomerism of, A., 1028.  
 Triaryl- $\beta$ -hydroxybutyric acids, decomposition of, A., 158.  
 Triarylmethane dyes, manufacture of, (P.), B., 928.  
 Triarylmethyl halides, reaction of, with magnesium phenyl bromide, A., 1240.  
 Triarylpropinenes, derivatives of, A., 260.  
 Triarylsulphonium chlorides, A., 506.  
 1:3:5-Triazidobenzene, 2:4:6-trinitro-, as an initiating explosive, B., 49.  
 Triazines, synthesis of, A., 67.  
   manufacture of, (P.), B., 973.  
 $\gamma$ -Triazines, A., 758.  
 Triazo-compounds, replacement of nitrogen by hydrogen in, catalytically, A., 1119.  
 7:8-Triazolquinoline, A., 1050.  
 7:8-Triazolquinoline-5-arsinic acid, A., 1050.  
 1:12-2:3-10:11-Tribenzoperylenedicarboxylic anhydride, A., 731.  
 3:6:9-Tribenzoylcarbazole, A., 1041.  
 2:4:6-Tribenzoylphloroglucinaldehyde, A., 859.  
 Tribenzoylthammol, and its oxime, A., 275.  
 Tribenzylamine, *p*-toluenesulphonyl derivative, A., 375.  
 Tribenzyltrimethylenetriamine, and its derivatives, A., 726.  
*Tribolium confusum*, influence of humidity on toxicity of fumigants to, B., 570.  
 Tri-*n*-butylcarbethoxymethylammonium bromide, A., 605.  
 Tri-*n*-butylcarbomethoxymethylammonium bromide, A., 605.  
 Triisobutylstibine, salts and oxides of, A., 866.  
 Tributyltrimethylenetriamines, and their salts, A., 726.  
 Tricaprins, metabolism of. See under Metabolism.  
*s*-Tri-(*p*-carbethoxyphenyl)guanidine, A., 840.  
 Tricetin, constitution of, A., 1256.  
 Tricosane-8:16-dione, and its disemicarbazone, A., 58.  
 Tricresol mercuriacetate, agricultural and hygienic uses of, B., 300.  
 Tridecane- $\beta$ -methylcellotetraoside, A., 501.  
*n*-Tridecoic acid,  $\mu$ -amino-, and its derivatives, A., 1118.  
   *p*-halogenophenacyl ester, A., 744.  
 Tri(dimethylphenyl)sulphonium chlorides, A., 507.  
 Tri- $\beta$ -diisopropylidene-fructose phosphate, and its salts, A., 1238.  
 Tri- $\beta$ -diisopropylidene-fructosephosphoric acid, and its salts, A., 1238.  
 Tridymite, use of iron compounds in preparation of, from quartz, B., 23.  
   manufacture of stones of, (P.), B., 345.  
 Triethylacetamidine, and its hydrochloride, A., 727.  
 Triethylcarbethoxymethylammonium bromide, A., 605.  
 Triethylcarbomethoxymethylammonium bromide, A., 605.  
 Triethylcarboxymethylammonium bromide, A., 605.  
 Triethylgermane, A., 606.  
 Triethylgermanide, potassium derivative, A., 606.  
 Triethylgermanium salts and oxide, A., 606.  
 Triethylmethane. See  $\gamma$ -Ethylpentane.  
 Triethylsulphonium salts,  $\beta$ -trichloro-, and  $\beta$ -mono-,  $\beta\beta'$ -di-, and  $\beta$ -tri-hydroxy-, A., 251.  
 Tri-2-furfurylamine, formation of, from hydrofuramide, A., 519.  
 Triglycerides, polymorphism of, A., 798.  
 Trigonelline, production of, from raw coffee, B., 367.  
   formation of, in plants, A., 975.  
*aa* $\beta$ -Tricyclohexylethane, A., 608.  
 Trihydrol, physiological effect of, in water, A., 425.  
 Tri-3-indolylphosphine oxide, A., 954.  
 Triketotrimethylenetriphenylmethane-4-carboxylic acid, and its reduction, A., 270.  
 Trilobines, constitution of, A., 1048.  
 Trilobinemethylmethines, and their derivatives, A., 1048.  
 Trimellitic acid, ethyl ester, A., 851.  
 Tri-*i*-menthyl orthophosphate, A., 276.  
 2:4:6-Trimethoxyacetophenone, *aaa*-tri-bromo-, A., 164.  
 4:5:6-Trimethoxyaporphine, 3-hydroxy-, synthesis of, A., 69.  
 3:4:5-Trimethoxybenzaldehyde, preparation of, A., 384.  
 2:3:4-Trimethoxybenzanil, A., 388.  
 2:4:5-Trimethoxybenzene, cyano-, A., 53.  
   1-nitro-, A., 401.  
 2:4:5-Trimethoxybenzoic acid, A., 400.  
 Trimethoxybenzoylacetophenones, A., 620.  
 2:3:4-Trimethoxybenzoylformic acid, and its aniline salt, A., 388.



- 3-(3':4':5'-Trimethoxybenzoyl)-5:7-di-hydroxy-3:4':5'-trimethoxyflavone, and its diacetyl derivative, A., 1256.
- 3:3':4'-Trimethoxy-*p*-benzoyloxybenzaldehyde, A., 1031.
- 3:3':4'-Trimethoxybenzoyloxybenzoic acid, and its chloride, A., 1031.
- 6:3':4'-Trimethoxy-1-benzyl-2-methyltetrahydroisoquinoline, 2'-amino-, dipicrolonate, A., 69.
- 3:4:5-Trimethoxy-2- $\alpha$ -chloropropenylphthalide, A., 848.
- 7:3':5'-Trimethoxy-3:5-di- $\beta$ -glucosidoxylavium chloride, 4'-hydroxy-, A., 1140.
- 4:3':4'-Trimethoxy-6:6'-dimethylchalcone, 3-hydroxy-, A., 388.
- 7:3':5'-Trimethoxy-3:5-di-(*O*-tetra-acetyl- $\beta$ -glucosidoxylavium chloride, 4'-hydroxy-, A., 1140.
- 3:4:3'-Trimethoxy-4'-ethoxy-6-methylchalcone, A., 388.
- 2:3:10-Trimethoxy-9-ethoxyprotoberberinium iodide, A., 177.
- 3':6:7-Trimethoxy-4'-ethylcarbonato-1-benzyl-3:4-dihydroisoquinoline, 2'-nitro-, and its methiodide, A., 69.
- 3':4':5'-Trimethoxyflavone, 5:7-dihydroxy-, and its diacetyl derivative, A., 1256.
- Trimethoxyflavones, and 5:7-dihydroxy-, A., 621.
- 4:3':4'-Trimethoxy-6'-methylchalcone, A., 388.
- 2:4:5-Trimethoxyphenylacetic acid, A., 400.
- $\beta$ -3:4:5-Trimethoxyphenylethylamine,  $\beta$ -hydroxy-, and its derivatives, A., 55.
- 2:3:10-Trimethoxyprotoberberinium salts, 9-hydroxy-, A., 177.
- 2:4:6-Trimethoxypyrimidine, rearrangement of, in presence of methyl iodide, A., 404.
- Trimethoxyquinic acids, and their derivatives, A., 850.
- 7:8:4'-Trimethoxy-2-styrylchromone, A., 520.
- 1:4:8-Trimethoxythioxanthone, and its salts, A., 860.
- Trimethylacetamide, action of nitrous acid on, A., 1023.
- $\gamma$ -Trimethylacetyl- $\beta$ -phenyl- $\alpha$ -*p*-nitrophenylbutyric acids, and their derivatives, A., 269.
- $\gamma$ -Trimethylacetyl- $\alpha$ -phenyl- $\beta$ -*p*-tolylbutyric acid, and its derivatives, A., 153.
- Trimethylamine, compound of, with ferric inositolphosphate, A., 1127.
- administration of, to cold-blooded animals, A., 204.
- determination of, in foods, B., 701.
- Trimethylamylarsonium salts, A., 1120.
- Trimethyl-L-arabinose, action of dilute alkali on, A., 145.
- 1:2':3'-Trimethyl-2:3-benzanthraquinone, A., 1136.
- Trimethyl-1:4-benzopyrones, A., 853.
- 2:4:6-Trimethylbenzoylacetacetic acid, ethyl ester, A., 1250.
- 2:4:8-Trimethylbenzoyldiacetylmethane, and its copper salt, A., 1250.
- 1:2:2-Trimethyl-5-benzyl- $\Delta^2$ -pyrroline, and its perchlorate, A., 622.
- 3:4:3'-Trimethyl-5-bromomethyl-4'- $\beta$ -carboxyethylpyrromethene hydrobromide, 5'-bromo-, A., 173.
- $\beta\beta\gamma$ -Trimethylbutane, quenching of mercury radiation by, A., 325.
- Trimethyl-*n*-butylarsonium salts, A., 1119.
- 2:5: $\beta$ -Trimethylcinnamic acid, derivatives of, A., 278.
- 3:4:8-Trimethylcoumarin, A., 519.
- Trimethyl-5:5'-di(bromomethyl)- $\beta$ -carboxyethylpyrromethene hydrobromides, A., 173.
- 4:3':5'-Trimethyl-3:4'-diethylpyrromethene, 5-hydroxy-, derivatives of, A., 627.
- 1:2:7-Trimethyl-3:4-dihydronaphthalene, A., 604.
- Trimethyldihydronaphthalenes, A., 278.
- 2:2:4-Trimethyl-1:2-dihydroquinoline, and its salts and derivatives, A., 1142.
- 2:2:4-Trimethyldihydroquinolinophenylcarbamide, A., 1142.
- 2:4:6-Trimethyldiphenyl, and diamino-, acetyl derivative, triamino-, di- and tri-bromo-, di- and tri-nitro-, and nitrodiamino-, A., 1240.
- Trimethyldiphenylamines, 2:4-dinitro-, A., 1124.
- $\alpha\beta\beta$ -Trimethyldipropyl ether,  $\beta\beta$ -dihydroxy-, A., 363.
- $\gamma\gamma\lambda$ -Trimethyl- $\Delta^{\gamma\kappa}$ -dodecadien- $\alpha$ -ol, A., 1110.
- $\gamma\gamma\lambda$ -Trimethyl- $\Delta^{\kappa}$ -dodecenc- $\alpha\gamma$ -diol, A., 1110.
- Trimethylene sulphate, A., 250.
- Trimethylene glycol, bacterial production of, A., 429.
- dimethyl ether, A., 251.
- Trimethylene oxide, oxygen valency angle and electric moment of, A., 1190.
- 2:3-Trimethylene-4:5-dihydropyrene-6:7-dicarboxylic anhydride, preparation of, from benzanthrene, A., 1131.
- 3:5-Trimethylenepiperidine, and its salts, A., 753.
- 3:5:3'-Trimethyl-4'-ethyl-4- $\beta$ -carboxyethylpyrromethene, 5'-bromo-, hydrobromide of, A., 174.
- 3:5:5'-Trimethyl-4-ethyl-4'- $\beta$ -carboxyethylpyrromethene hydrobromide, A., 281.
- Trimethylethylene, formation of, in rearrangement of isomylaniline to *p*-amino-*tert*-amylbenzene, A., 1124.
- 1:4:4-Trimethyl-1-ethylcyclohexane-3:5-dione, A., 738.
- 1:1:2-Trimethyl-2-ethylcyclopropane, A., 606.
- 5:3':5'-Trimethyl-4'-ethylpyrromethene hydrobromide, 4-cyano-, A., 1260.
- Trimethylfurans, synthesis of, A., 1255.
- 2:4:5-Trimethylfuran-3-carboxylic acid, and its ethyl ester, A., 1255.
- 3:4:5-Trimethylfurfuraldehyde, A., 1255.
- 3:4:5-Trimethyl-2-furoic acid, A., 1255.
- 2:3:6-Trimethylgalactonolactone, A., 1113.
- Trimethylgallaldehyde, preparation of, A., 161.
- 2:3:4-Trimethylglucose, structure of, A., 45.
- 2:3:6-Trimethylglucose, synthesis of, A., 603.
- NN'**N''*-Trimethylguanidine salts, A., 605.
- $\epsilon\eta$ -Trimethylheptadecan- $\epsilon$ -ol, A., 832.
- $\epsilon\eta$ -Trimethyl- $\Delta^6$ -heptadecene, A., 832.
- $\beta\gamma\zeta$ -Trimethylheptan- $\gamma$ -ol- $\epsilon$ -one, A., 499.
- 2:2:4-Trimethylhexahydrobenzaldehyde semicarbazone, A., 600.
- 2:2:4-Trimethylhexahydrobenzoic acid, A., 600.
- Trimethylcyclohexanones, and their derivatives, A., 161.
- $\delta$ -(1:1:3-Trimethyl-2- $\Delta^2$ -cyclohexenyl)- $\beta$ -methylbutadiene- $\alpha$ -carboxylic acid, ethyl ester, A., 852.
- $\alpha$ -(1:1:3-Trimethyl-2- $\Delta^3$ -cyclohexenyl)- $\gamma$ -methyl- $\Delta^{\alpha\epsilon}$ -hexadien- $\gamma$ -ol,  $\gamma$ -hydroxy-, A., 853.
- $\alpha$ -(1:1:3-Trimethyl-2- $\Delta^3$ -cyclohexenyl)- $\gamma$ -methyl- $\Delta^{\alpha\epsilon}$ -hexatriene, A., 853.
- $\epsilon$ -(1:1:3-Trimethyl-2-cyclohexyl)- $\gamma$ -methyl-*n*-amyl alcohol, and its bromide, A., 853.
- $\delta$ -(1:1:3-Trimethyl-2-cyclohexyl)- $\beta$ -methylvaleric acid, and its ethyl ester, and  $\beta$ -hydroxy-, derivatives of, A., 852.
- 1:2:2-Trimethyl-1-( $\alpha$ -hydroxy- $\alpha$ -cyanoethyl)- $\Delta^2$ -cyclopentene, A., 277.
- Trimethylindolinone, and nitro-, A., 65.
- Trimethylindolylphosphine oxides, A., 954.
- 1:1:5-Trimethyl-2- $\gamma$ -keto- $\Delta^{\alpha}$ -butenyl- $\Delta^{2,3}$ -cyclohexadiene, and its semicarbazone, A., 600.
- N*-Trimethylisoleucine, and its chloroaurate, A., 631.
- Trimethylmangostin, derivatives of, A., 855.
- Trimethyl-*N*-methyladenosine, A., 285.
- Trimethyl-*N*-methylguanosine, and its hydrochloride, A., 1043.
- 3:5:5-Trimethylmetoxazinetetrahydride, and its salts, A., 504.
- 1:2:5-Trimethylnaphthalene, derivatives of, A., 1256.
- 1:2:7-Trimethylnaphthalene, A., 604.
- Trimethylnaphthalenes, preparation of, from 2:6-dimethylnaphthalene, A., 261.
- synthesis of, and their salts, A., 278.
- 1:3:7-Trimethyl- $\beta$ -naphthol, A., 261.
- N*-Trimethylnorleucine, and its salts, A., 631.
- N*-Trimethylnorvaline, and its chloroaurate, A., 954.
- $\beta\beta\zeta$ -Trimethylpentadecic acid, and its derivatives, A., 832.
- ethyl ester, A., 832.
- $\beta\beta\zeta$ -Trimethylpentadecic acid,  $\beta$ -hydroxy-, ethyl ester, A., 832.
- $\beta\beta\zeta$ -Trimethylpentane, f.p. of, A., 1081.
- 1:4:7-Trimethylphenanthrene, and its salts and derivatives, A., 839.
- Trimethylphenanthrenes, and their salts and derivatives, A., 1024.
- 1:2:3-Trimethyl-3- $\beta$ -phenoxyethylindoleninium iodide, A., 288.
- 1:2:4:6-Trimethylphenyl  $\alpha\beta$ -diphenylethyl ketone, A., 1251.
- d*-2:4:6-Trimethylphenyl  $\alpha$ -phenylethyl ketone, A., 1251.
- 2:4:6-Trimethylphenyl 2:4:6-trimethylbenzyl ketone, A., 1250.
- 1:2:3-Trimethylcyclopropane-1-carboxylic acid, and its methyl ester, A., 1143.
- 2:3:2'-Trimethyl-4'-isopropylidiphenyl, A., 612.
- 3:4:5-Trimethylpyrazoline-5-carboxylic acids, derivatives of, A., 863.
- 2:3:4-Trimethylpyrrole, derivatives of, A., 1144.
- Trimethylribofuranose, A., 285.
- Trimethylsuccinic acid, bromo-, A., 614.
- 2:2:4-Trimethyltetrahydroquinoline, A., 1142.
- 2:2':2''-Trimethyltriphenylmethane, 4:4':4''-triamino-, A., 1025.
- 2:2':4'-Trimethyltriphenylmethane-2''-carboxylic acid, and its methyl ester, A., 270.
- N*-Trimethylvaline, and its chloroaurate, A., 954.
- Trioses, derivatives of, and their transformations, A., 367.
- and their derivatives, physiology of, A., 645.
- Trioxime, amino-. See Propane,  $\alpha$ -amino- $\alpha\beta\gamma$ -trioximino-.
- Trioxymethylene, transformation of, in polyoxymethylene, A., 721.
- Tricyclopentadienes, and their derivatives, A., 938.
- $\beta\gamma\gamma$ -Triphenylallyl alcohol, and its derivatives, A., 762.
- Tri-( $\epsilon$ -phenyl-*n*-amyl)amine, tri- $\beta$ -hydroxy- and its hydrochloride, A., 394.
- $\alpha\beta\gamma$ -Triphenyl- $\gamma$ -anisylpropane,  $\alpha\gamma$ -dihydroxy-, A., 617.

- Triphenylarsinehydroxybenzenesulphonamide, A., 529.
- Triphenylarsine-*mmm*-tristibinic acid, A., 867.
- Triphenylbenzamides, 3:5-dichloro-substituted, rearrangement of, A., 846.
- Triphenylbismuthine dichloride, crystal structure of, A., 1080.
- $\alpha\beta\beta$ -Triphenylbutane, A., 838.
- $\alpha\alpha\delta$ -Triphenyl-4 $\alpha$ -butene, A., 838.
- Tri-(8-phenylbutyl)amine, *tri*- $\beta$ -hydroxy-, and its hydrochloride, A., 394.
- Triphenylcarbimide, *tri*-*p*-nitro-, A., 597.
- Triphenylcarbinol, reaction of, with thiophenols, A., 1027.
- Triphenyldiphenyleneallyl alcohols, A., 1024.
- $\alpha\alpha\gamma$ -Triphenyl- $\gamma$ -diphenylpropane,  $\alpha\gamma$ -*di*-hydroxy-, A., 617.
- Triphenylethides, alkali derivatives, constitution of, A., 838.
- Triphenylgermanide, sodium derivative, reaction of, with halogenated methanes, A., 629.
- Tri(phenylglycineamide)arsine, and its oxide, A., 1268.
- $\alpha\beta\gamma$ -Triphenylguanidine,  $\alpha\beta\gamma$ -*tri*-*p*-amino- and  $\alpha\beta\gamma$ -*tri*-*p*-nitro-, A., 376.
- Tri-( $\xi$ -phenyl-*n*-hexyl)amine, *tri*- $\beta$ -hydroxy-, and its hydrochloride, A., 395.
- Triphenylmethane, A., 383, 1132.  
derivatives, dipole moments of, A., 677.  
with linked benzene nuclei, A., 270, 1032.
- Triphenylmethane, chloro-, reactivity of, with alcohols, A., 255.
- Triphenylmethane dyes, A., 733.  
electrolytic oxidation of leuco-bases of, B., 848.
- Triphenylmethane-2:4:2':2'-tetracarboxylic acid, and its tetramethyl ester, A., 270.
- Triphenylmethyl, reaction of, with perbenzoic acid, and with benzoyl peroxide, A., 379.  
bromide, *p*-chloro-, A., 1240.  
chloride, reaction of, with  $\alpha$ -methylmannoside and methylpentosides, A., 146.  
chloride and fluoride, reaction of, with diphenyl-*p*-phenylenediamine, A., 263.  
ethers, catalytic fission of, by hydrogen and oxygen, A., 369.
- 6-Triphenylmethylglucosidopyridinium chloride, A., 369.
- 6-Triphenylmethylglucosidotrimethylammonium bromide, A., 369.
- 1:2:4-Triphenyl-3-methylpyrazopyrrolid-6-one, A., 171.
- 1:2:4-Triphenylnaphthalene-3-carboxylic acid, ethyl ester, A., 1257.
- Triphenylphosphine dichloride, action of magnesium alkyl iodides on, A., 291.
- Triphenylphosphine-*mmm*-tristibinic acid, A., 867.
- $\alpha\alpha\beta$ -Triphenylpropan- $\alpha$ -ols,  $\beta$ -amino-, A., 382.
- Tri-( $\gamma$ -phenylpropyl)amine, *tri*- $\beta$ -hydroxy-, and its hydrochloride, A., 394.
- $\alpha\alpha\beta$ -Triphenylpropylene oxides, A., 382.
- 2:3:6-Triphenylpyridine, and its picrate, A., 385.
- Triphenylstibine-*mmm*-tristibinic acid, A., 867.
- $\alpha\alpha\beta$ -Triphenyl- $\beta$ -*p*-tolylethyl alcohol, A., 746.
- $\alpha\alpha\beta$ -Triphenyl- $\beta$ -*p*-tolylethylene, A., 746.
- Triphenylvinyl iodide, A., 762.
- Triphenylvinylcarbithionic acid, A., 762.
- Tri-*n*-propylcarbomethoxymethylammonium bromide, A., 605.
- Tri-*n*-propylcarbomethoxymethylammonium bromide, A., 605.
- Tri-*n*-propylcarbomethoxymethylammonium bromide, A., 605.
- Tri(isopropylethynyl)carbinol, A., 497.
- Tri(isopropylideneglucose-3) phosphate, tri-(triphenylmethyl)-derivative, A., 255.
- 2:2':2''-Tripyridyls, and their derivatives, A., 284.
- Tri-3-pyridylarsenoxide, and its hydrochloride, A., 761.
- Trisaccharides, Raman spectra of, A., 559.  
enzymic hydrolysis of, A., 649.
- Trisazo-dyes, manufacture of, (P.), B., 254.  
direct green, manufacture of, (P.), B., 593.
- Tristhiophthénylbisoxindole, A., 753.
- Tris-2-thiotolénylbisoxindole, A., 752.
- Tristhioxénylbisoxindoles, A., 752.
- Triterpenes, dehydration of, and determination of their molecular weights, A., 517.
- Triterpene acids, hydroxy-, A., 856.
- Trithionic acid. See under Sulphur.
- Tri-*p*-toluenesulphonyl-*d*-mannitol  $\alpha\zeta$ -dibenzoate, A., 929.
- 2:3:4-Tri-*p*-toluenesulphonyl- $\beta$ -methylglucoside, 6-iodo-, and its 6-nitrate, A., 254.
- 3:4:6-Tri-*p*-toluenesulphonyl-2-methyl- $\beta$ -methylglucoside, A., 500.
- Tritoluidinomethanes, and their hydrochlorides, A., 1025.
- s*-Tri-*p*-toluylbenzene, A., 522.
- Tritolylarsinehydroxy-*p*-toluenesulphonamides, A., 528.
- Tritolylselenonium salts, A., 181.
- Tri-*p*-tolylsulphonium chloride, A., 507.
- Trochodendron aralioides*, composition of wood of, B., 183.
- Troilite, in Chilian hexahedrite, A., 1230.
- Troostite, crystal structure of, A., 114.
- Tropaeocaine, detection of, B., 656.
- Tropics, acid-base equilibria with inhabitants of, A., 1277.
- Trout, nutrition of, A., 87.  
nutritive requirements of, A., 1282.  
sea, death of, in estuary of River Tees, B., 626.
- Trout eggs. See under Eggs.
- Trouton's rule, application of, to mixed liquids and solutions, A., 567.
- $\alpha$ -Truxillamic acid. See 2:4'-Diphenylcyclobutane-1'-carboxylic acid, 2'-amino-.
- $\alpha$ -Truxillie acid, degradation of, A., 158.
- Truxillie acids, degradation of, A., 1030.
- $\delta$ -Truxinamic acid, and its derivatives, A., 158.
- neo*Truxinamic acids, and their derivatives, A., 159.
- $\delta$ -Truxinic acid, degradation of, A., 158.
- neo*Truxinic acid, and its derivatives, A., 159.
- Truxinic acids, degradation of, A., 1030.
- Trypaflavine, auto-complex coacervation of, A., 1203.  
effect of atropine and thyroidectomy on hyperglycaemia from, A., 877.
- Trypan, effect of, on formation of glycogen, A., 425.
- Trypanocidal activity, A., 840.  
and chemical constitution, A., 69, 70, 180, 408, 1268.
- Trypanocides, manufacture of, (P.), B., 80.
- Trypanosomiasis, chemotherapy with indium in, A., 297.
- carbohydrate metabolism in, A., 82.  
intermediate metabolism of guinea-pigs in, A., 769.
- Trypsin, homogeneity of solutions of, A., 194.
- Trypsin, production of ereptic action in solutions of, A., 777.  
action of, on binary mixtures of proteins, A., 304.  
on collagen, B., 393.
- Tryptophan, and its derivatives, absorption of, in the organism, A., 1282.  
metabolism of. See under Metabolism.  
determination of, in glutelins, A., 1051.
- dl*-Tryptophan, growth-promoting power of, A., 299.
- Tryptophan-*N*-sulphonic acid, and its potassium salt, A., 1023.
- Tryptophanuria, A., 872.
- Tsuga*, resin from, A., 275.
- Tsugaresinol, and its derivatives, A., 275.
- Tsugie acid, A., 275.
- Tubadiolol acid, and its methyl ester, A., 400.
- Tubaic acid, constitution of, A., 860.  
reduction of, A., 165.
- Tubes, metal. See Metal tubes.
- Tuberculin, stability of solutions of, A., 198.  
active principle of, A., 197.  
cytotoxic action of, A., 198.
- Tuberculosis, diagnosis of, A., 418.
- ultra-virus of, A., 431.
- distribution of calcium in, A., 770.
- calcification in, by calcium diethyl phosphates, A., 873.
- constituents of cardiac muscle in, A., 770.
- fission of fat in, by lipases, A., 969.
- accumulation of iron in, A., 643.
- effect of lysosome on, A., 770.
- phosphatase in, A., 873, 874.
- phosphorus in blood and plasma in, A., 770.
- pyrophosphatase in, A., 874.
- taka-pyrophosphatase in, A., 874.
- acidity of urine in, A., 769.
- calcification following doses of viosterol in, A., 770.
- in thorax, preparation for treatment of, (P.), B., 449.
- bone, effect of viosterol on, A., 770.
- pulmonary, serum-calcium in, A., 873.
- vitamin therapy in, A., 873.
- Tubing, rubber. See Rubber tubing.
- Tumours, metabolism of, A., 644, 767, 1160, 1278.  
metabolism of thiol compounds in, A., 872.  
resistance of, A., 641.  
respiration of, effect of amino-acids on, A., 641.  
effect of salts of organic acids on, A., 1281.  
inhibitors for, from normal tissues, A., 768.  
reducing power of, A., 1157.  
anaerobic activation of glycolysis in, A., 1056.  
lipin content of, A., 1277.  
 $p_H$  of malignant cells of, A., 417.  
phosphorylation in glycolysis of, A., 1278.  
proteolysis in, A., 1278.  
chicken, causative agent of, A., 1157.  
protein-free virus of, A., 960.  
human, lipins of, A., 186.  
malignant, effect of magnesium salts on, A., 1278.  
glutathione content and autolysis of, A., 959.  
growth-promoting substance of, A., 1156.  
testicular, anterior pituitary hormone in cases of, A., 970.
- Tumour extracts, acceleration of fermentation by, A., 418, 872.

**Tung oil**, thickening of, (P.), B., 270.  
 refractive index of, B., 776.  
 drying rate of, B., 901.  
 polymerisation of, with cashew nut-shell liquid, (P.), B., 900.  
 prevention of gelation and frosting of, B., 612.  
 baking of solid films of, B., 313.  
 from Australian *Aleurites Fordii*, B., 152.  
 detection of, B., 850.  
**Tungsten**, distribution of, in Bolivia, A., 596.  
 recovery of, from its ores, (P.), B., 775.  
 superficial nitrification of, (P.), B., 989.  
 absorption spectrum of, A., 3.  
 N-lines in spectrum of, A., 788.  
 K-series spectrum of, A., 788.  
 electric furnace spectrum of, A., 891.  
 Lambert's cosine law for glow of, A., 2.  
 photo-electric threshold for, A., 105.  
 radiation from, on electronic bombardment, A., 1184.  
 emission of secondary electrons from, A., 105.  
 emission of positive ions from, A., 1185.  
 surface ionisation of potassium by, A., 980.  
 electrodeposition of, A., 1097.  
 thermo-electric properties of, A., 1207.  
 specific heat of, A., 220.  
 caesium films on, A., 459.  
 diffusion of molybdenum in, A., 221.  
 and its oxides, equilibrium of, with hydrogen and water vapour, A., 1204.  
 action of iodine on, A., 128.  
 production of articles of, (P.), B., 191.  
 manufacture of eyelets of, (P.), B., 989.  
 active, catalytic decomposition of ammonia on, A., 704.  
**Tungsten alloys**, (P.), B., 472.  
 with beryllium and iron, (P.), B., 609.  
 with chromium and molybdenum, (P.), B., 68.  
 with cobalt and iron, A., 456.  
 with iron, and their carbides, structure of, A., 1081.  
 with iron and nickel, hot-hard, B., 644.  
 with molybdenum carbide for tools, etc., (P.), B., 191.  
**Tungsten compounds**, calculation of constants of, A., 11.  
**Tungsten carbide**, manufacture of, (P.), B., 1088.  
 for use in drill bits, (P.), B., 344.  
 manganese as cement for, (P.), B., 731.  
 electrical conductivity of, A., 328.  
 alloys containing, (P.), B., 311, 731.  
 manufacture of, (P.), B., 989, 1123.  
 production of hard alloy with cobalt and, (P.), B., 1088.  
 hard metallic compositions containing, (P.), B., 68.  
 refractory materials from, (P.), B., 1088.  
 tools from, (P.), B., 513.  
 production of tools, dies, etc., from, (P.), B., 472.  
 carbides, formation and quantitative separation of, A., 708.  
 hexachloride, reactions of, A., 352.  
 trioxide, production of, (P.), B., 547.  
 Tungstic acids, digestion of, with sodium hydroxide, A., 823.  
 Tungstates, buffer action of solutions of, A., 572.  
**Tungsten organic compounds**:—  
 Tungsten carbonyl, manufacture of, (P.), B., 422, 600.

**Tungsten detection and determination**:—  
 detection of, microchemically, A., 1104.  
 determination of, microcolorimetrically, A., 1224.  
 in quick-drawn steel, B., 185.  
**Tungsten bronze**, sodium, structure of, A., 450.  
**Tungsten filaments**, manufacture of, (P.), B., 684.  
 treatment of, (P.), B., 684.  
**Tungsten ores**, removal of phosphorus from, (P.), B., 847.  
 determination in, of tin, B., 644.  
**Tungsten wire**, manufacture of, (P.), B., 112.  
**Tungstogermanic acids**. See under Germanium.  
**Tunicates**, cellulose from, A., 968.  
 Tunicin, least equivalent of, A., 149.  
**Tunnels**, vehicular, at Blackwall and Rotherhithe, ventilation of, B., 786.  
**Turanose**, acetyl and halogenoacetyl derivatives of, isomeric, A., 1115.  
**Turbines**, gas and steam, blades for, (P.), B., 895.  
 sheet-metal laggings for, (P.), B., 373.  
**Turf**, closely-cut, effect of ammonium and ferrous sulphates on, B., 697.  
**Turkey red oils**, manufacture of substitutes for, (P.), B., 173.  
**Turnbull's blue**, constitution of, A., 32.  
**Turnips**, manuring of, in New Zealand, B., 696.  
**Turpentine**, purification of, B., 116.  
 obtained by sulphate method, B., 517.  
 water-soluble fatty acids in, B., 996.  
 phenols in, B., 996.  
 effect of injection of, on calcium content of serum, A., 1070.  
 effect of, on antibody formation, A., 1060.  
 American, fractionation of, and determination of its pinene content, B., 392.  
 Indian, from *Pinus longifolia*, A., 61.  
 sulphate-wood, determination of sulphur and chlorine in, B., 70.  
 fluoroscopic detection of petroleum derivatives in, B., 1040.  
**Turpentine oils**, polymerisation of, A., 996.  
**Turquoise**, A., 596.  
**Tussah-silk fibroin**. See under Silk fibroin.  
*Tussilago farfara*, taraxanthin from, A., 976.  
**Tutocaine**, detection of, A., 632.  
 in presence of novocaine and larocaine, B., 1136.  
**Tutton's salts**, structure of, A., 681.  
**Twitchell reagent**, B., 29, 269.  
 properties of constituents of, B., 777, 1124.  
**Twort-d'Hérelle phenomenon**, A., 969.  
**Tychite**, crystal structure of, A., 218.  
**Tyndall effect**, demonstration of, A., 993.  
**Tyramine**, synthesis of, A., 843.  
 enzymic oxidation of, A., 90.  
 detection of, A., 1150.  
**Tyramine**, fluoro-, and its picrate, A., 1130, 1247.  
**Tyres**, rubber, vulcanisation of, (P.), B., 120.  
 fabrics for, B., 1093.  
 rubber product for sealing punctures in, (P.), B., 950.  
**Tyrosinase**, A., 649.  
 iron in relation to, A., 650.  
 potato, A., 1286.  
**Tyrosine**, 3-fluoro-, A., 1130, 1247.  
 diiodo-, action of acetic anhydride on, and its derivatives, A., 1129.

**Tyrosine**, diiodo-, iodide elimination from, in tryptic digestion, A., 415.  
 effect of, on abnormal thyroid metabolism, A., 546.  
**Tyrosine-ON-disulphonic acid**, and its potassium salt, A., 1023.  
**Tyrosine-N-phenylacetic acid**, and its esters, hydrogen chloride additive products of, A., 739.  
**Tyrosine-3-sulphonic acid**, A., 944.  
**Tyrosinosis**, A., 1159.  
**Tyrosyltyrosine**, titration constant of, A., 468.

## U.

**Ultra-centrifuge**, A., 246.  
**Ultra-filters**, (P.), B., 1061.  
 blocking phenomena in, A., 461, 691.  
**Ultrafiltration**, A., 119.  
 device for holding membranes for, A., 138.  
**Ultramarine**, structure of, A., 351.  
 reaction of, with sodium iodoazide, A., 29.  
 spotting of paper painted with, under glass, B., 1090.  
**Ultramarines**, preparation of, A., 919.  
 relation of, to sulphide permutites, A., 350.  
**Ultra-porosity and wetting**, A., 804.  
**Umbelliferone**, in micro-sublimates from *Asafetida*, B., 287.  
**Uncompahgrite**, of Colorado, changes in, A., 1229.  
**Undecamethylmaltotriose**, A., 501.  
**Undecane-1:11-diamidine picrate**, A., 55.  
**6-Undecenoylamino-2-methylquinoline**, derivatives of, A., 623.  
**2-Undecenylbenzimidazole**, A., 722.  
**Undecic acid**, acid potassium salt, A., 1018.  
 glycerol ester, A., 1018.  
 p-halogenophenacyl esters, A., 744.  
**Undecic acid**,  $\kappa$ -thiol-, and its derivatives, A., 408.  
**Undecyl p-nitrophenylurethane**, A., 1232.  
**Units**, interconversion factors for, A., 896.  
**Unsaturated compounds**, A., 258.  
 quantum theory of, A., 901.  
 stereoisomerism of, A., 834.  
 valency tautomerism of, A., 746.  
 dipole moments of, A., 1077.  
 and free radicals, A., 1016.  
 catalytic hydrogenation of, A., 1231.  
 oxidation of, A., 498.  
 catalysis of, by ferricyanides, A., 128.  
 polymerisation of, A., 927.  
 action of diazo-compounds on, A., 609.  
 reactions of, A., 1242.  
 conjugated, A., 158, 365, 600, 618.  
 simple or conjugated, orientating influence of free and bound ionic charges on, A., 729.  
**Uracil**, metabolism of. See under Metabolism.  
 Uracil, amino-, formation of diazouracil anhydride from, A., 66.  
**Uracil-4-acetic acid**, preparation of, A., 754.  
**Uracil-5-azobenzene**, A., 524.  
**Uræmia**, A., 960.  
*isoUramil*, and its 5-O-acetyl derivative, A., 1041.  
**Uraninite**, from Manitoba and Ontario, A., 1229.  
**Uranium**, isotopes of, A., 317, 1185.  
 preparation of, A., 485.

- Uranium, electrolytic production of, from fused fluoride, (P.), B., 1088.  
range of  $\alpha$ -particles from, A., 106.  
disintegration constant of, A., 790.  
relation between radium and, A., 5.  
action of radiation of, on plants, B., 363.
- Uranium compounds, quadrivalent, A., 708.
- Uranium carbide, alloys containing, (P.), B., 731.  
chloride, sexavalent, solutions of, A., 1092.  
hydride, manufacture of, (P.), B., 465.  
nitride, heat of formation of, A., 998.  
Peruranates, A., 1100.
- Uranium determination:—  
determination of, in carnotite ore, B., 598.  
in pitchblende, A., 244.
- Uranium I and II, range of  $\alpha$ -rays from, A., 1186.
- Uranium-X, separation of, from uranium, A., 924.
- Uranium- $X_1$ , half-life period of, A., 535.
- Uranium-Y, half-value period of, A., 443.
- Uranium-Z,  $\beta$ - and  $\gamma$ -rays from, A., 555.
- Uranium minerals, determination of actinium in, A., 590.
- Uranothorites from Norway, A., 1015.
- Urea (*carbamide*) in higher plants, A., 101, 313.  
formation of, in the body, A., 422, 544, 1059, 1064.  
in relation to amino-acid disappearance, A., 189.  
synthetic resin from furfuraldehyde and, (P.), B., 737.  
fermentation of, A., 196.  
decomposition of, in soils, B., 695, 1128.  
pharmacology of, A., 960.  
excretion of, by the liver, A., 639.  
prevention of fixation in inflammation by, A., 1279.  
salivary, determination of, A., 639.  
determination of, A., 531.  
asbestos filters for, A., 293.  
in blood and urine. See under Blood and Urine respectively.
- Urease, A., 777.  
chemical nature of, A., 544.  
action of chlorides on, A., 1064.  
action of dyes on, A., 1287.  
action of fluorides and of sodium tungstate on, A., 1287.  
action of papain on, A., 92.  
co-enzyme for, A., 882.  
crystalline, A., 92, 531, 650.  
proteolytic degradation of, A., 649.  
soya-bean, purification of, A., 92.
- Ureides in higher plants, A., 101, 313.
- Ureido-3-(3'-3''-aminobenzamido-4'-methylbenzamidocarbazoledisulphonic acid, and its sodium salt, A., 176.
- Ureido-3'-aminobenzoyl-3-amino-4-methylbenzoyl- $\beta$ -naphthylamine-4:6:8-trisulphonic acid, sodium salt, A., 840.
- Ureido-3-aminobenzoyldehydrothio-*p*-toluidinesulphonic acid, and its sodium salt, A., 176.
- Ureido-3-aminocarbazoledisulphonic acid, and its sodium salt, A., 176.
- 7-Ureidoaminofluorenone-2-arsinic acid, and its sodium salt, A., 761.
- Ureido-3-(3'-amino-4'-methylbenzamido)-carbazoledisulphonic acid, and its sodium salt, A., 176.
- Ureido-3'-amino-4'-methylbenzoyl-3-amino-4-methylbenzoyl- $\beta$ -naphthylamine-4:6:8-trisulphonic acid, sodium salt, A., 840.
- Ureido-3'-amino-4'-methylbenzoyl-3-amino-4-methylbenzoyl- $\beta$ -naphthylamine-4:6:8-trisulphonic acid, sodium salt, A., 840.
- Ureidehydrothio-*p*-toluidinesulphonic acid, and its sodium salt, A., 176.
- Ureidolactose, physiological behaviour and enzymic hydrolysis of, A., 1289.
- Ureidomaltose, physiological behaviour and enzymic hydrolysis of, A., 1289.
- Ureometer, gasometric analysis with, A., 923.
- Urethane, compounds of, with acids and phenols, A., 936.
- Uric acid, origin of, in birds, A., 300.  
in plants, A., 662.  
solubility of, and its salts, A., 991.  
and its sodium salt, effect of caffeine and theophylline on, A., 425.  
and its methyl derivatives, acetylation of, A., 1044.  
oxidation of, in alkaline solution, A., 864.  
by hydrogen peroxide, A., 172.  
by iodine, A., 1044.  
catalytic oxidation of, A., 918.  
autooxidation of, in presence of amines, A., 67.  
effect of salicylates on, A., 425.  
action of, on activity of xanthine-oxidase, A., 649.  
compounds of, with proteins, A., 227.  
excretion of, A., 1277.  
by the liver, A., 640.  
stimulation of, by 2-anisylquinoline-4-carboxylic acid, A., 89.  
effect of diet on, in blood and urine, A., 772.  
endogenous, origin of, A., 531.  
and hæmatopoiesis, A., 962.  
endogenous and enterotropic, relation between, A., 185.  
and its salts, detection of, histologically, A., 184.  
determination of, in poultry excrement, A., 1156.  
in urine. See under Urine.
- Uricase, A., 428, 650.
- Urico-oxidase, A., 882.
- Uricolysis, A., 882.
- Urine, collection and examination of, A., 1056.  
scattering of light in, A., 295.  
device for collection of suspended particles from, (P.), B., 1137.  
acid-base balance in, A., 767.  
effect of grapes and their products on acidity of, A., 1056.  
albumin and  $\beta$ -albumin in, A., 958.  
allantoin in, A., 416.  
effect of administration of amino-acids on, A., 538.  
source of ammonia in, A., 295, 1056.  
bile pigments in, in icterus, A., 1158.  
excretion of bromides in, A., 89.  
carbohydrates in, A., 416.  
in diseases other than diabetes, A., 1279.  
formation of creatine and purines in, from protein, A., 84.  
diastase in, A., 1053.  
in diseases, A., 418.  
influence of liver on glycuronic acid and urobilin in, A., 1158.  
hormone-like substance in, influencing diuresis, A., 656.  
gonadotropic hormones from, A., 885.  
ovarian hormone in, A., 199.  
pituitary hormones in, A., 885.  
ketonic substances in, during starvation, A., 189.
- Urine, lactic acid in, during hepatic disturbance, A., 536.  
excretion of lead in, A., 1277.  
occurrence of methylamine in, A., 767.  
nitrogen in, during protein feeding, A., 84.  
effect of urea ingestion on nitrogen partition of, A., 535.  
excretion of oxyproteic acid and sulphur in, A., 416.  
relation of sulphur content and iodic acid value to ether-soluble phenols in, A., 1056.  
excretion of phosphates in, during fasting, A., 1283.  
phosphorus in, A., 956.  
hydrolysable phosphorus compounds of, A., 766.  
origin of pigments in, A., 295.  
proteases in, A., 186.  
excretion of proteins in, A., 639.  
protein and pseudoprotein in, A., 295.  
racemisation curves of proteins of blood-plasma, oedema fluid and, A., 642.  
pyridine derivatives in, A., 767, 959.  
sex-inhibitory substance in, A., 781.  
sugars in, A., 767.  
effect of activity of sweat glands on uric acid and phosphate in, A., 640.  
effect of, on blood-pressure, A., 1284.  
of avian cloaca, mineral constituents of, A., 1277.  
of blood-group A, specific substance from, A., 1153.  
chicken, A., 417.  
dog's, determination in, of allantoin, A., 84.  
frog's, glomerular, reducing power of, A., 956.  
determination in, of uric acid, A., 872.  
human, secretion of, A., 1155.  
antigenic properties and group specificity of, A., 417.  
distribution of organic acids in, A., 1155.  
determination in, of atropine, A., 965.  
of various mammals, classification of nitrogen metabolic products in, A., 872.  
mare's, inactive phenol from, A., 1156.  
of pregnant mares, hormones in, A., 433, 547.  
of pregnancy, anterior pituitary hormone from, A., 97.  
bromine reaction of, A., 640.  
purulent, A., 82.  
sheep's, calculi in, A., 80.  
pigment in, A., 417.  
of women, hormones in, A., 547.
- Urine, analytical methods relating to:—  
luminescence analysis of, A., 1155.  
detection in, of acetone, A., 535.  
of carbohydrates, A., 186.  
of diastase, A., 79, 640.  
of formaldehyde, A., 186.  
of glucose and lactose, A., 767.  
of lead, A., 774.  
of porphyrin, A., 417.  
of proteins, A., 296.  
of pus, by biuret reaction, A., 960.  
of tryptophan, A., 872.  
determination in, of acetone, A., 640.  
of acidity, A., 535, 1276.  
of bases, A., 767.  
of bile acids, A., 1055.  
of bile pigments, A., 1158.  
of bromide, A., 412.  
of chlorine, A., 1056.  
of dialkylbarbituric acids, A., 640.  
of galactose, A., 183.  
of glycuronic acid, A., 640.

- Urine, determination in, of guaiacol, A., 535.  
 of hippuric acid, A., 1276.  
 of  $\mu\text{H}$ , A., 958.  
 of hydroxypurines and uric acid, A., 295.  
 of 8-hydroxyquinoline, A., 640.  
 of iodine, A., 535.  
 of ketone substances, A., 1272.  
 of magnesium, A., 1056.  
 of nitrogen, A., 1155.  
 of organic acids, A., 958.  
 of oxalic acid, A., 1156.  
 of oxyproteic acid, A., 416.  
 of phenol derivatives, A., 186.  
 of free protein- and non-protein-sugar in, A., 75.  
 of sugar, A., 79, 295.  
 of sulphur, photometrically, A., 295.  
 of urea, A., 535, 640, 1155.  
 of uric acid, A., 417.  
 of "uroselectan," A., 767.
- Urobilin, and its derivatives, fluorescence of, A., 185.  
 effect of *l*-proline and *l*-oxyproline on, A., 79.  
 in urine, influence of liver on, A., 1158.
- Urobilin substances, A., 534, 1272.  
 determination of, spectrophotometrically, A., 640.
- Urobilinæmia, artificial, A., 1272.
- Urobilinogen, effect of *l*-proline and *l*-oxyproline on, A., 79.  
 in blood-serum, A., 412.  
 determination of, spectrophotometrically, A., 640.
- Uronic acid, origin of, in humus, A., 661.
- Uronic anhydride groups, determination of, microchemically, in pectic substances, A., 602.
- Uroporphyrin in bones in ochronosis, A., 81.  
 action of liver on, A., 85.
- iso*Uroporphyrin, derivatives of, A., 285.
- "Uroselectan," determination of, in urine, A., 767.
- Ursolic acid, and its derivatives, A., 61.
- Uteroverdin, and its derivatives, A., 77, 627.
- V.
- Vaccines, preservation of, (P.), B., 961.  
 specific, production of, (P.), B., 1056.
- Vaccine virus, effect of chemicals on survival of, A., 1291.
- Vacua, production of, (P.), B., 85.  
 technique of, A., 358.  
 permeability of, A., 901.  
 control of flow of gases into, A., 37.  
 high, production of, A., 139; (P.), B., 244\*.  
 greasless valve for, A., 37.
- Vacuum apparatus, automatic control for, A., 1106.  
 detection of leaks in, (P.), B., 213.
- Vacuum pans, (P.), B., 1012.
- Vacuum tubes, insulating coatings for filaments of, (P.), B., 433.
- Vagus, substance of, A., 547.
- Valency, A., 322.  
 variation of, with atomic structure, A., 111.  
 and spectroscopy, A., 2, 901.  
 and magnetism, A., 324.  
 and circular dichroism, A., 111.  
 homopolar, theory of, in polyatomic molecules, A., 111.
- Valeramide sulphate, A., 55.
- n*-Valer-*p*-ethoxyphenylhydrazide, A., 1142.
- Valer-*as*-*p*-ethoxyphenylmethylhydrazides, A., 1142.
- Valeric acid, acid potassium salt, A., 1018.  
*p*-chlorophenacyl ester, A., 744.
- n*-Valeric acid, dithio-, *as*-phenylmethylhydrazide of, A., 51.
- Valeric acids, *o*- $\beta$ -phenylpropionamidophenyl esters, A., 1026.
- iso*Valeroamidine, derivatives of, A., 756.
- Valerolactone, decomposition of, A., 931.
- 2-*iso*Valerothienone-indophenine, A., 752.
- Valerylglycylglycine,  $\alpha$ -*di*bromo-, A., 1064.
- iso*Valerylidenebisdi-indone, A., 1252.
- iso*Valeryl-leucines,  $\alpha$ -bromo-, A., 149.
- iso*Valeryl-norleucines,  $\alpha$ -bromo-, A., 149.
- Valine, natural, configuration of, and its derivatives, A., 837.
- iso*Valines, action of nitrous acid on amino-alcohols derived from, A., 1126.
- Valonia ventricosa*, structure of walls of, A., 438.
- Valves, automatic operation of, B., 707.  
 abrasives for grinding of, (P.), B., 1032.  
 electrolytic. See Electrolytic valves.  
 float, with counter-weights, B., 243.  
 greasless, A., 246.  
 thermionic, carbonised nickel for anodes in, (P.), B., 352.  
 cathodes for, (P.), B., 114, 514, 1089.  
 hot cathodes for, (P.), B., 804.  
 indirectly heated cathodes for, (P.), B., 559, 804.  
 oxide cathodes for, (P.), B., 804.  
 electron-emission material for, (P.), B., 1089.  
 coating of filaments of, (P.), B., 473.  
 grids for, (P.), B., 558.  
 introduction of cesium into, (P.), B., 896.  
 wedge-operated disc, (P.), B., 582.
- Vanadinite, Spanish, A., 830.
- Vanadium in sedimentary rocks, A., 926.  
 extraction of, from its ores and its application, B., 309.  
 recovery of, from its ores, (P.), B., 775.  
 spectrum of, A., 208.  
 production of ductile wire from, (P.), B., 557.
- Vanadium salts, polarographic studies with, A., 1093.
- Vanadium compounds, complex, A., 31.
- Vanadium carbide, reactions of, A., 1218.
- niobate, in N. Brazil, A., 493.
- dioxide, band spectrum of, A., 557.
- trioxide, as catalyst in reduction of nitro-compounds, A., 819.
- pentoxide, colloidal, solubility and light adsorption of, A., 692.
- Vanadic acid, reduction of, by hydrobromic acid, A., 576.  
 by hydrochloric acid, A., 704.  
 precipitation and protection of, by serum proteins, A., 1271.  
 glass electrode titration of, A., 814.
- Vanadium detection, determination, and separation:—  
 detection of, A., 137.  
 microchemically, A., 1104.  
 determination of, colorimetrically, A., 244.  
 gravimetrically, and its separation from chromium, A., 244.  
 volumetrically, A., 356.  
 and chromium, B., 149.  
 in presence of chromium and manganese, A., 36.  
 electrometrically, in iron alloys, rustless steels, ferrovanadium, etc., B., 149.  
 in steel, B., 552, 1083.
- Vanadium, determination of, in alloy steel, B., 605.  
 electrometrically, in self-hardening steels, B., 1083.  
 in soils and rocks, A., 591.  
 colorimetrically, in titanomagnetites, A., 712, 1104.  
 separation of, from arsenic, A., 244.
- Vanadium ores, removal of phosphorus from, (P.), B., 847.
- iso*Vanillic acid, 6-nitro-, and its acetyl derivative, A., 759.
- Vanillin, production of, (P.), B., 138, 974.  
 extraction and determination of, in chocolate and cacao butter, B., 239.  
 solubility of, in alcohol and glycerol, A., 615.  
 use of, as a colour reagent, A., 836.  
 determination of, microchemically, A., 530.
- Vanillin, bromo-, and chloro-, condensation of, with acetophenone, A., 516.  
 6-nitro-, and its phenylhydrazone, A., 615.
- o*-Vanillin, 5-nitro-, A., 855.
- Vanillylethylamine, pharmacology of, A., 877.
- 4-*o*-Vanillylideneaminoacetophenone, A., 750.
- Vanillylidenebisthiolacetic acid, A., 1235.
- Vanillylidenediacetophenones, *mono*-, *di*-, and *tri*-bromo- and chloro-, A., 516.
- o*-Vanillylidenehomophthalimide, melting point of, A., 1145.
- Vanillylmethylamine, pharmacology of, A., 877.
- Vaporisation, affinity of, on plates of rectifying columns, A., 1083.
- Vaporisers, (P.), B., 1013.  
 maintaining constant flow of liquid residues from, (P.), B., 822.
- Vapours, optical rotation of, A., 323.  
 saturation of air with, A., 1199.  
 complex, design of absorbing and stripping columns for, B., 579.  
 condensable, determination of, in gases, (P.), B., 1113.  
 mixed, fractionation of, (P.), B., 454.  
 saturated, adiabatic expansion of, A., 906.  
 See also Gases.
- Vapour density, determination of, A., 454, 1013.
- Vapour pressure, measurement of, by torsion method, A., 1013.  
 at high temperatures, A., 1226.  
 apparatus for, A., 684.  
 calculation of, A., 684.  
 nomograph for, A., 247.  
 and its application to adsorption and evaporation, A., 988.  
 of binary mixtures, A., 330.  
 of binary mixed liquids, A., 1083.  
 of saturated salt solutions, A., 22, 339.  
 partial, of binary liquids, A., 687.  
 small, measurement of, A., 801.  
 gauge for, A., 1226.
- Varanus salvator* (giant lizard), oil from, A., 532.
- Varnishes, B., 31.  
 production of, (P.), B., 197, 474, 737, 779, 807.  
 on laboratory and factory scales, B., 195.  
 from sulphite waste liquors, (P.), B., 614.  
 drying of, (P.), B., 355, 392.  
 effect of carbon dioxide in boiling of, B., 806.  
 blooming of, B., 947.

- Varnishes**, natural and artificial ageing of, B., 1091.  
 flaking of, from teak, B., 517.  
 weathering of, B., 562.  
 physical properties of films of, B., 613.  
 effect of capillarity in films of, B., 1040.  
 stability of films of, towards mineral acids, B., 996.  
 orientation of surface molecules and molecular polishing of, B., 153.  
 use of asphalt from acid sludge instead of gilsonite in, B., 996.  
 product from thickened fatty oils for use in, (P.), B., 612.  
 use of hempseed oil in, B., 31.  
 use of synthetic resins in, B., 851.  
 resinous condensation products for, (P.), B., 948.  
 relative merits of enamels and, B., 562.  
 treatment of paper and fabrics with, (P.), B., 1025.  
 composition for removal of, (P.), B., 234.  
 solvents for removal of, (P.), B., 687.  
 wax-conditioned remover for, (P.), B., 998.  
 exposure tests on, B., 195, 196, 271.  
 for boats, testing of, B., 356.  
 for furniture, accelerated ageing tests on, B., 947.  
 for patent leather, drying of, B., 153.  
 clear, development of opacity of, B., 314.  
 copal, manufacture of, B., 901.  
 artificial, B., 117.  
 four-hour, false claims for, B., 562.  
 insulating. See Insulating varnishes.  
 limed rosin, cooking of, B., 196.  
 nitrocellulose, application of, (P.), B., 272.  
 oil, drying of, B., 392.  
 matting agents for, B., 562.  
 solvents and diluents for, B., 562.  
 olivine as medium for, B., 806.  
 hardening, production of, (P.), B., 518.  
 patterned, production of, (P.), B., 31.  
 printing, plant for production of, (P.), B., 154.  
 containing rubber, manufacture of, (P.), B., 997.  
 analysis of, B., 996.  
 fluorescence analysis of, B., 613.  
 tests on, in the tropics, B., 271.  
 detection in, of nitrocellulose, B., 356.  
*Vateria indica*, seed fat of, B., 354.  
**Vegetables**, growth of, in relation to soil acidity, B., 568.  
 fertilisers for, B., 567.  
 town wastes as, B., 695.  
 prevention of discoloration of, (P.), B., 1007.  
 reducing substances in, A., 658.  
 iron content of, A., 665.  
 conservation of iron in, in cooking, B., 784.  
 effect of solid and gaseous carbon dioxide on transient diseases of, B., 1048.  
 canned, effect of acidity on colour of, B., 702.  
 effect of  $p_H$  on, B., 702.  
 thermophilic anaerobic bacteria from, B., 285.  
 preserved, influence of containers on quality of, B., 862.  
**Vegetable juices**, flocculation of, in alkaline medium, B., 1097.  
**Vegetable materials**, curing or smoking of, (P.), B., 47.  
 preservation of, in storage, (P.), B., 838.  
**Vegetarians**, basal metabolism of, A., 962.  
**Velocity of adsorption** from solution, A., 459.  
**Velocity of crystallisation**, A., 450.  
 influence of interfaces on, A., 460.  
**Velocity of esterification** of racemic substances, A., 1094.  
**Velocity of hydrogenation**, catalytic, A., 347.  
**Velocity of polymerisation** of hydrocarbons, A., 232, 233.  
**Velocity of reaction**, mechanism of reaction from, A., 814.  
 in heterogeneous systems, A., 917.  
 in solution, A., 916.  
 in a vessel surrounded by mercury, A., 576.  
 bimolecular, in solution, A., 475.  
 heterogeneous, A., 577.  
 temperature increment of, A., 475, 577, 1003, 1094.  
 interchange coefficient of, A., 343.  
 mass, of solids, A., 1094.  
 organic, A., 576.  
 uni- and bi-molecular, A., 232.  
**Velocity of solution**, in non-aqueous media, A., 345.  
 of salts in water, A., 345.  
 of solids, apparatus for comparison of, A., 138.  
 of readily soluble substances, A., 234.  
**Velocity of sound**. See under Sound.  
**Velvet**, dress, boil-off, dyeing, and finishing of, B., 1117.  
**Veratraldehyde**, 2-bromo-, A., 513.  
**Veratrole**, 4-hydroxy-, A., 383.  
**Veratroylveratrylamine**, A., 55.  
**Veratrylidenebisthiolacetic acid**, A., 1235.  
**Veratrylidenediketohydrindene**, A., 1252.  
**Verbenone**, formation of, by oxidation of  $\alpha$ -pinene by selenium dioxide, A., 1253.  
**Vermicides**, pyrethrum as, B., 158.  
**Vermin-killers**, (P.), B., 290.  
**Veronal**, polymorphism of, A., 523.  
 activity of neodorm, novonal, and, A., 301.  
 test for purity of, B., 367.  
 colour reactions of, B., 863.  
 determination of, B., 702.  
**Vesuvianite**, formula of, A., 247.  
 from Monte Rosso di Verra, A., 1106.  
**Veszelyite** from Vaskö, A., 595.  
**Vibrio cholerae**, symbiosis of, with bacteriophage, A., 654.  
**Vibrio septique**, agglutinogens of, A., 1170.  
**Vinasses**, determination of source of, by analysis, B., 814.  
 determination in, of alcohol, B., 910.  
*Vinca minor*. See Periwinkle.  
**Vines**, effect of tartaric acid and glucose on metabolism in leaves of, A., 975.  
 nitrogen content of leaves of, A., 436.  
 relation between mobilised reserves in sap of, and fruit crop produced, B., 362.  
 "diagnostic" wood of, A., 1179.  
 treatment of diseases of, with arsenic and lead, B., 1097.  
 treatment of oidium and mildew of, with potassium permanganate and copper acetate, B., 954.  
 use of dyes for control of mildew in, B., 319.  
 control of puncture-vine in, in California, B., 908.  
**Vinegar**, preparation of, from coffee-fruit pulp, B., 77.  
 corrosion of bronzes in, B., 845.  
 fermented and artificial, differentiation of, B., 1051.  
 malt, manufacture of, B., 783.  
 wine, determination of non-volatile acids in, B., 282.  
**Vinegar**, wine- and spirit-, distinction between, B., 1133.  
**Vinyl chloride**, production of, from ethylene dichloride, (P.), B., 331.  
 manufacture of polymerides of, (P.), B., 31.  
 catalytic addition of hydrogen chloride to, A., 819.  
 compounds, polymerised, coating compositions from, (P.), B., 807.  
 esters, production of, (P.), B., 1114.  
 combination of fatty oils with, (P.), B., 437.  
 ethers, manufacture of, from acetylene, (P.), B., 670.  
 polymerisation products of, (P.), B., 851, 1071, 1114.  
**Vinylacetic acid**,  $\alpha$ -bromo-, and 2-chloro-, ethyl esters, and their isomerism, A., 930.  
**Vinylacetylene**, and its hydrate, A., 40.  
 addition of hydrogen chloride to, A., 1231.  
 $\alpha$ -Vinylcinnamic acid, reduction of, with sodium amalgam, A., 739.  
**Vinylglycollic acid**, ethyl ester, action of phosphorus tribromide on, A., 929.  
**1-Vinyl- $\Delta^1$ -cyclohexene**,  $\alpha$ -chloro-, A., 1232.  
**1-Vinylnaphthalene resin**, polymerisation of, and its salts, A., 839.  
**3-Vinylloxazolinium picrate**, 2-amino-, A., 256.  
**5-Vinylpyrazoline**, and its salts, A., 754.  
**Violaxanthin**, isolation of, from flowers, A., 1257.  
 "Violet acid," in chamber process for sulphuric acid, formation of, A., 1219.  
*iso*Violuric acid. See Alloxan 6-oxime.  
**Viosterol**, production of vascular sclerosis by, A., 1176.  
 effect of, on calcification in tuberculosis, A., 770.  
 on tetany, A., 642.  
 in relation to cod-liver oil, A., 201.  
*Vipera aspis*, constituents of blood-serum of, A., 635.  
**Virginium**, detection of, magneto-optically, A., 355.  
**Viruses**, A., 969.  
 purification and concentration of, A., 430.  
 protein-free suspensions of, A., 94, 1291.  
 plant, filtration of, A., 977.  
*Viscaria vulgaris*. See *Lychnis viscaria*.  
**Viscera**, iron content of, A., 957.  
 iron and carbon of pigments in, A., 186.  
**Vischnevitte**, A., 249.  
**Viscose**, B., 59, 255, 498, 499, 673, 1022.  
 manufacture of, (P.), B., 97, 499, 500.  
 preparation of cellulose material for, (P.), B., 97.  
 analysis of desulphurising bath for, B., 717.  
 maturation of, B., 59.  
 mordanting of, for dyeing with acid and chrome colours, B., 978.  
 ripening of, B., 717.  
 determination of ripeness of, B., 223.  
 viscosity of, B., 835.  
 influence of alkali-cellulose on, B., 1022.  
 dialysis of, B., 1022.  
 treatment of solutions of, (P.), B., 977.  
 filters for solutions of, (P.), B., 461.  
 manufacture of solutions of low viscosity of, (P.), B., 17.  
 syneresis of, A., 693.  
 influence of quality of water and hydrochloric acid on ash content of cellulose for, B., 380.  
 manufacture of fibres of, (P.), B., 97.

- Viscose**, manufacture of artificial threads, filaments, etc., of, (P.), B., 303, 595, 1024.  
 manufacture of films of, (P.), B., 225.  
 manufacture of artificial materials from, (P.), B., 500.  
 production of sheet materials from, (P.), B., 929.  
 manufacture of shaped artificial sponge masses from, (P.), B., 977.  
 manufacture of threads, etc., of, (P.), B., 225.  
 production of dull threads, etc., from, (P.), B., 417.
- Viscosimeters**, (P.), B., 788, 923.  
 upward-flow, filling device for, A., 593.  
 for volatile and hygroscopic liquids, A., 1226.  
 Engler, theory of, B., 627.
- Viscosity**, determination of, with small quantities of liquids, B., 707.  
 errors in, A., 224.  
 coefficients as measure of, A., 329.  
 calibration of apparatus for measurement of, A., 593.  
 determination of association by means of, A., 566.  
 of binary systems, A., 340.  
 of colloids, A., 335.  
 of colloidal suspensions, A., 121, 909.  
 of strong electrolytes at infinite dilution, A., 461.  
 of gases, A., 685.  
 at high pressures, A., 116.  
 of mixed gases, A., 14; B., 915.  
 of liquids, A., 14.  
 determination of, (P.), B., 373.  
 theory of, A., 116.  
 of highly-polymerised compounds, A., 225.  
 of solutions of long thin molecules, A., 121.  
 of dilute solutions of strong electrolytes, A., 120.  
 of tar, pitch, etc., B., 134.  
 anomalous, of colloids, A., 121.  
 non-uniform, theory of, B., 867.  
 structure, A., 995.
- Vitacampor**, A., 948.
- Vitamins**, A., 1293.  
 nature and function of, A., 1069.  
 international standards for, A., 886.  
 extraction of, (P.), B., 127.  
 production of extracts rich in, (P.), B., 207.  
 effect of light on synthesis of, A., 309.  
 photochemistry of, A., 656, 886.  
 action of radioactive substances on, A., 1173.  
 physiology of, A., 97, 886.  
 growth and cell-reserves in reference to, A., 1173.  
 influence of, on growth of new-born children, A., 972.  
 action of, on bactericidal power of blood, A., 658.  
 requirement of, for cattle, A., 423.  
 diet of rats bred for tests on, A., 886.  
 in bread, B., 445.  
 in foods, effect of cooking on nutritive value of, B., 750.  
 in canned foods, B., 655.  
 fruit preparations containing, (P.), B., 575.  
 in milk, A., 416.  
 in plants, A., 1176.  
 in spinach, B., 911.  
 concentrate of, from vegetables, (P.), B., 1054.  
 in relation to food analysis, B., 621.  
 anti-beriberi, crystalline, from yeast, A., 547.
- Vitamins**, antineuritic, A., 97, 309, 433, 657, 1069.  
*in vitro* effect of concentrates of, A., 200.  
 crystalline, preparation of, from yeast, A., 310.  
 antirachitic, reaction of, A., 301.  
 antiscorbutic, A., 310, 1294.  
 crystalline, properties and structure of, A., 658.  
 fat-soluble, A., 309.  
 effect of mineral oil administration on, A., 200.  
 requirements of, for growth of pigs, A., 973.  
 determination of, in cod-liver oil emulsions, B., 152.  
 growth-promoting, A., 782.  
 reactions for, in cod-liver oil, A., 973.  
 detection of, biologically, A., 547.  
 determination of, A., 886.  
 in foods, A., 309.
- Vitamin-A**, structure of, A., 1174.  
 characterisation of, A., 309, 1174.  
 absorption spectrum of, A., 657.  
 oxidation of, *in vitro*, A., 886.  
 effect of, on oxidation of linoleic acid, A., 782.  
 and carotene, A., 200, 657, 1069, 1174.  
 transformation of carotene to, A., 97.  
 administration of, as carotene, A., 309.  
 relation of isomeric carotenes to, A., 1256.  
 chlorophyll as, A., 309.  
 in relation to iodine-fat balance, A., 547.  
 oxidisability of substances containing, A., 309.  
 absorption spectra of derivatives of, A., 1174.  
 in butter, effect of ultra-violet light on, A., 433.  
 formation of, from carotene in the organism, A., 973.  
 in cod-liver oil, A., 782, 886.  
 in fish meals, B., 701.  
 from fish oils, A., 200.  
 content of, in foods, A., 782.  
 in halibut liver oil, A., 656, 782.  
 in horse melanosisarcoma, A., 296.  
 in milk of species of cows, A., 416.  
 in pecan nuts, A., 657.  
 in Pacific Coast salmon oils, B., 70.  
 content of, in liver in various animals, A., 1174.  
 in human liver, A., 1293.  
 in serum and organs of higher animals, A., 433.  
 influence of deficiency of, on male rats, A., 1175.  
 growth response of rats to, A., 886.  
 intestinal absorption of, in rats, A., 97.  
 absorption of nitrogen and of fat from the alimentary canal in deficiency of, A., 1175.  
 transmission of, from parents to young, A., 1175.  
 content of, in commercial preparations, A., 886.  
 ferrous iodide as substitute for, A., 972.  
 detection of, with antimony trichloride, A., 656.  
 using 7-methylindole, A., 1175.  
 in cod-liver oil emulsions, B., 736.  
 determination of, A., 97, 886, 1175.  
 in cod-liver oil, A., 97, 1293.  
 separation of, from carotene and xanthophylls, A., 972.
- Vitamin-B**, international standard for, A., 1175.  
 ultra-violet absorption spectra of preparations of, A., 1175.
- Vitamin-B**, sparing action of fats on, A., 657.  
 rôle of, in utilisation of proteins, A., 657.  
 requirements of, in relation to carbohydrate administered, A., 783.  
 effect of, on growth, A., 973, 1069.  
 on lactation, A., 1069.  
 acid-balance in blood and glucose tolerance in lack of, A., 886.  
 effect of depletion of, on learning activities of rats, A., 973.  
 coprophagy in rats deprived of, A., 200.  
 in bread, B., 621.  
 in egg-yolk, A., 973.  
 in evaporated milk, B., 911.  
 in peanuts, B., 861.  
 complex, distribution of, A., 200.
- Vitamin-B**, preparation of, A., 1069.  
 photochemical synthesis of, A., 1294.  
 inanition dependent on deficiency of, A., 1175.  
 and iron in diet of children, A., 876.  
 crystalline, A., 782.
- Vitamin-B**, effect of, on carbohydrate metabolism, A., 1069.  
 assay of foods for, A., 310.
- Vitamin-B**, A., 782.
- Vitamin-C**, A., 201, 783, 1069.  
 isolation and identification of, A., 973.  
 chemical identification of, A., 1175.  
 chemical nature of, A., 657, 886.  
 identity of, with hexuronic acid, A., 657.  
 narcotine as precursor of, A., 1294.  
 substitution of, by pituitary hormones, A., 433.  
 in fodder plants, A., 1176.  
 from lemon juice, A., 201.  
 in milk, relation between reducing power and, A., 1276.  
 in cow's and goat's milk, A., 657.  
 in winter-stored moosberry juice and preserved black currant juice, B., 784.  
 in orange-crush beverage, B., 815.  
 in potatoes, A., 97.
- Vitamin-D**, formation of, in dried beer-yeast by ultra-violet rays, A., 887.  
 production of, in the glow discharge, A., 887.  
 crystal structure of, A., 327.  
 chemistry of, A., 1070.  
 standardisation of, A., 97.  
 potency of preparations of, A., 783.  
 biological evaluation of, A., 309, 548.  
 photographic records of tests of, A., 658.  
 mode of action of, A., 887.  
 effect of, on calcium conservation, A., 974.  
 and parathyroid on bones and growth, A., 1176.  
 effect of deficiency of, on gall bladders, A., 98.  
 in nutrition of dairy calves, A., 1176.  
 effect of overdosage of, on white mice, A., 783.  
 in cod-liver oil, A., 782, 886.  
 in egg-yolk from irradiated hens, A., 1294.  
 stearin as source of, A., 783.  
 crystalline, A., 311, 658.  
 determination of, A., 97, 659, 1176, 1294.  
 See also Calciferol.
- Vitamin-D**, esters of, A., 845.  
 crystalline, A., 311.
- Vitamin-E**, A., 312, 783.  
 in pharyngeal secretion of bees, A., 1295.  
 in iron-treated dry rations, A., 434.  
 requirements of, for poultry, A., 783.  
 effect of deprivation of, on lactating rats, A., 1176.
- Vitamin-M**, A., 434.



Vitamins-*A* and -*D*, sources of, for growing chicks, A., 433.  
reserves of, in elasmobranchs, A., 433.  
Vitamins-*B*<sub>1</sub> and -*B*<sub>2</sub>, concentration of, A., 434.  
requirements of, for lactation, A., 434.  
in yeast, A., 782.  
assay of, A., 1294.  
Vitamins-*C* and -*D*, influence of deficiency of, on calcium phosphate in serum of rats and guinea-pigs, A., 887.  
Vitamins-*D*<sub>1</sub> and -*D*<sub>2</sub>, properties of, A., 201.  
Vitasterol-*D*, A., 1070.  
Vitellin, A., 294.  
Vitellinic acid, hydrolysis of, A., 1269.  
Vitreous bodies, colour formation in, B., 466.  
Vitreous state, A., 325.  
dilatometry of, A., 14.  
Volatile substances, removal of, from solids, (P.), B., 406.  
separation of, from those less volatile, (P.), B., 5.  
Volcanic ash beds in Alberta, A., 360.  
Volcanic tuffs, determination of soluble silica in, A., 825.  
Volcanoes, X-ray diffraction of glasses and ashes from, A., 1015.  
microflora of old ash of, A., 1067.  
Central American, ash of, A., 596.  
Fuego, ash from, A., 927.  
of Tibesti, orthoclase lavas of, A., 493.  
Volta effect, A., 23.  
influence of radioactive substances on, A., 317.  
Voltaites, preparation and structure of, A., 482.  
Voltmeters, (P.), B., 354.  
Volume, apparent, of salts in solution, A., 335, 461.  
atomic, of elements in relation to distribution, A., 443.  
atomic and molecular, A., 322, 902.  
molecular, and density at absolute zero, A., 902.  
equivalence of gas constants and, A., 14.  
Vomicidine, and its benzoyl derivative, A., 179.  
Vomicine, structure of, A., 408.  
derivatives of, and nitro-, A., 179.  
Vomicinic acid, methylation of, and its derivatives, A., 179, 408.  
Vomiting of infants, alkalosis in, A., 640.

## W.

Wad, nature of, A., 1229.  
Walden inversion, A., 365.  
correlation of, with pinacol and Beckmann reaction, A., 1235.  
Walls, coverings for, (P.), B., 550, 998.  
damp-proofing of, (P.), B., 727.  
damp-proof compositions for, (P.), B., 468, 550.  
plaster for, (P.), B., 26.  
plastic compositions for, (P.), B., 902.  
treatment of, to prevent efflorescence, (P.), B., 26.  
Wall board, production of, from redwood bark, (P.), B., 720.  
from waste wood, etc., (P.), B., 602.  
treatment of bagasse for, (P.), B., 1075.  
ribbed, containing fibrous materials, (P.), B., 65.  
wooden, (P.), B., 107.  
Wangerin's reaction, A., 866.

Warfare, chemical, volatility and persistence of substances used in, B., 209.  
Washing of silk and other garments, (P.), B., 144.  
Washing agents, manufacture of, (P.), B., 116, 138, 995, 1020.  
Washing apparatus, countercurrent decantation, efficiency of, B., 484.  
intermittent, A., 925.  
Washing preparations, (P.), B., 960.  
Waste, combustion of, (P.), B., 633.  
farm, pulping of, (P.), B., 720.  
industrial, regulations for disposal of, B., 1058.  
effect of  $p_H$  on distillation of free ammonia nitrogen from, B., 530.  
effects of, on sewers, etc., B., 1058.  
sulphite, determination of dissolved oxygen in, B., 290.  
Watch glasses, manufacture of, from synthetic resins, (P.), B., 688.  
slotted, for use in electro-analysis, A., 592.  
Water, graphical representation of composition of, B., 866.  
molecular association of, A., 984.  
biological effect of, A., 659.  
types of binding of, A., 228.  
pure, preparation of, A., 828.  
purification of, B., 706; (P.), B., 370.  
apparatus for, (P.), B., 786.  
with powdered active carbon, B., 1106.  
with powdered hydraffin active carbon, B., 578.  
by electro-endosmosis, (P.), B., 945.  
by electrolysis, (P.), B., 130.  
use of ammonia in Tampa plant for, B., 402.  
regulation of chlorine content in, (P.), B., 402.  
with lime, (P.), B., 130.  
purification and softening of, (P.), B., 1058.  
 $p_H$  in disinfection of, by chlorination, B., 866.  
heating and removal of gases from, (P.), B., 628.  
chemical degassing of, B., 530.  
removal of free carbonic acid from, B., 242.  
dechlorination of, (P.), B., 82.  
precipitation of iron and humic acid from, at the Delmenhorst waterworks, B., 402.  
removal of iron, manganese, and phenols from, by the A.D.M. process, B., 130.  
elimination of manganese from, B., 626.  
removal of oil from, (P.), B., 406.  
filtration of, (P.), B., 82.  
filtration and softening of, (P.), B., 82.  
apparatus for, (P.), B., 706.  
softening of, (P.), B., 578.  
apparatus for, B., 290; (P.), B., 402.  
portable base-exchange apparatus for, (P.), B., 482.  
agents for, (P.), B., 928.  
by base-exchange, (P.), B., 370.  
with lime, B., 369.  
with lime and zeolites, B., 866.  
mixtures containing sodium phosphate for, B., 707.  
with zeolites, B., 1106.  
treatment of, with active carbon, B., 1106.  
apparatus for, with measured quantities of chemicals, (P.), B., 370.  
determination of hardness of, B., 450, 658.  
apparatus for testing hardness of, (P.), B., 373.

Water, units for expression of hardness of, B., 290.  
soap consumption in relation to hardness of, B., 754.  
removal of odour from, by aëration with compressed air, B., 753.  
and its determination, B., 962.  
removal of taste and odour from, B., 753.  
condition of, at high temperatures and pressures, A., 988.  
conditioning of, for brewing, (P.), B., 1004.  
laboratory distillation apparatus for, (P.), B., 1108.  
spectrum of, A., 444.  
absorption spectrum of, A., 896.  
infra-red absorption band spectrum of, A., 675.  
effect of electrolytes on infra-red spectrum of, A., 1188.  
Raman spectra of, A., 108, 559, 792.  
rotation-oscillation spectrum of, A., 982.  
absorption of, in visible spectral regions, A., 557.  
scattering of X-rays by, A., 11.  
electric arc discharge in, A., 580.  
electrolysis of, (P.), B., 432.  
apparatus for, (P.), B., 514, 898.  
in the Fauser cell, B., 803.  
electrolytic transport of, in salt solutions, A., 698.  
transference of, A., 1092.  
dielectric constant of, A., 120, 224, 677.  
temperature coefficient of, A., 8.  
influence of electrolytes on specific heat of, A., 691.  
heat of vaporisation of, A., 566.  
cooling towers for, (P.), B., 212.  
Kelvin scale temperature of freezing of, A., 220.  
frozen, vapour pressure of, A., 1195.  
isotherms of, at high temperatures, A., 906.  
heating of, (P.), B., 374.  
use of impure gases for, (P.), B., 452.  
reduction of scale in heaters for, (P.), B., 84.  
corrosion of water-jackets in gas-fired heaters for, B., 1059.  
surface type geyser for boiling of, (P.), B., 455.  
evaporation of, A., 906.  
vapour, absorption spectrum of, A., 673, 792, 1075.  
infra-red absorption spectrum of, A., 212.  
band spectrum of, A., 558.  
negative ions in, A., 106.  
entropy of, A., 695.  
adsorption of, by cellulose and its derivatives, A., 690.  
expansion of charcoal by, A., 1199.  
equation of state for, A., 454.  
humidity of mixtures of, with air, A., 1081.  
vapour pressure of, over aqueous solutions of alkaline-earth chlorides, A., 339, 573.  
over sulphuric acid, A., 801.  
specific volume of, A., 566.  
fluidity of, about 20° C., A., 14.  
absorption of, by fibre board and leather, A., 992.  
adsorption of paraffins by, A., 1199.  
effect of tobacco smoke on surface tension of, A., 569.  
concentrations of negative ions in electro-osmose apparatus for, B., 130.  
solubility of, in benzene, toluene and cyclohexane, A., 373.  
in granite magmas, A., 223.

Water, solution and dispersion of minerals in, A., 714.  
 coagulation processes for, B., 1106.  
 coagulation of, with lime and chlorine, B., 753.  
 free energy of, A., 1089.  
 aëration of, B., 242.  
   for transport of fish, etc., (P.), B., 322.  
 tests for colour and alkalinity of, B., 866.  
 control of  $p_H$  of, B., 370.  
 effect of dissolved carbon dioxide on  $p_H$  of, A., 471.  
 nomogram for  $p_H$ , alkalinity, and carbon dioxide in, B., 658.  
 occurrence of iodine in, A., 249.  
 manganese in, and its relation to filters, B., 1106.  
 influence of chlorides on permanganate consumption of, B., 962.  
 apparatus for control of addition of reagents to, (P.), B., 1138.  
 corrosion of concrete pipes by, B., 345.  
 salinity of, in muddy foreshore of estuary, A., 714.  
 soils for irrigation works for, B., 952.  
 bacteriology of, with lactose, brilliant green bile and Dominick-Lauter, A., 1170.  
 effects of age and storage temperatures on growth of bacteria in, B., 754.  
*colon-aërogenes* type of bacteria as evidence of faecal pollution of, B., 1105.  
 brilliant-green bile for *coli-aërogenes* determinations on, B., 866.  
 bacterial counts in, B., 50.  
 sampling apparatus for, A., 358.  
 preservation of samples of, B., 362.  
 Water, bactericidal, A., 198.  
 boiler, treatment of, (P.), B., 533.  
   mixtures of sodium phosphates for, (P.), B., 934.  
   softening of, (P.), B., 130.  
   chemistry of, B., 755.  
   determination in, of alkalinity, B., 819.  
   of carbonates and hydroxides, B., 819.  
   of phosphates, B., 963.  
 boiler-feed, treatment of, (P.), B., 164, 786, 1060.  
   conditioning of, B., 163, 915.  
   purification of, (P.), B., 210.  
   parallel-scale charts in, B., 323.  
   use of phosphate for, B., 50.  
 de-aëration of, (P.), B., 868.  
 removal of gases from, (P.), B., 485.  
 analytical control of softening plant for, B., 483.  
 determination of residual hardness in, B., 1059.  
 rôle of solids in foaming of, B., 451.  
 treatment of, for prevention of scale, B., 819.  
 of high chloride content, determination of hardness of, by Wartha's method, B., 1011.  
 chlorinated, bacteriological tests on, B., 1138.  
 clarified, determination in, of aluminium hydroxide, B., 370.  
 condenser, removal of oil, light petroleum, and benzene from, B., 820.  
 intermittent chlorination of, B., 706.  
 conductivity, determination in, of copper and lead, A., 826.  
 distilled,  $p_H$  of, A., 135.  
 toxicity of, A., 642.  
 effluent, determination of iron in, colorimetrically, B., 50.  
 irrigation, measurement of salinity of, with Wheatstone bridge, B., 952.

Water, mineral, sterilisation of, with Katadyn, B., 1053.  
 evaluation of, B., 1053.  
 neutral, corrosion of, B., 843.  
 Newark, ammoniation of, B., 658.  
 salt, in sand, salinity exchange of, with overflowing fresh water, A., 714.  
 soft, production of, on board ship, etc., (P.), B., 82.  
 Spot Pond reservoir, Boston, Mass., control of taste and odour of, B., 1106.  
 supply, removal of tastes and odours from, B., 1138.  
   seasonal manganese in, B., 369.  
   London, Jan.-Dec., 1931, B., 625.  
   Pacific coast, removal of colour from, B., 210.  
   Rahway, N.J., deodorisation of, with active carbon, B., 626.  
   in the tropics, Eijkman's test on, B., 530.  
 surface, de-ionised iron in, B., 1138.  
 waste, plant for purification of, (P.), B., 82.  
   removal of floating and non-floating substances from, (P.), B., 210.  
   treatment of, with active charcoal, B., 130.  
   from dairies, disposal of, B., 482.  
   from Sierra Almagra mines, B., 754.  
   determination of chlorine value of, B., 1058.

#### NATURAL WATER:—

radioactivity of, A., 38.  
 organic carbon content of, A., 594.  
 coloured, decolorisation of, B., 82.  
 of Alberta, relation between iodine in, and prevalence of goitre, A., 1227.  
 in the East Indies, iodine in, A., 594.  
 of S.E. Dakota, iodine content of, A., 594.  
 of Texas, manganese bacteria in, A., 307.  
 of U.S.S.R., containing radium and mesothorium, A., 1227.  
 determination of  $p_H$  of, colorimetrically, A., 241.  
 Drinking water, purification of, (P.), B., 818.  
   treatment of, with active charcoal, B., 130.  
   with chemicals, (P.), B., 370.  
 membrane filters for filtration of, B., 290.  
 "chemical odour" of, B., 50.  
 elimination of taste and odour from, B., 402.  
 action of copper on bacteria in, B., 450.  
 zinc in, B., 578.  
 field tests of quality of, B., 1010.  
 importance of *Bacillus coli* tests on, B., 402.  
 of Belgrade, conductivity of, A., 829.  
 alkaline and saline, physiological effects of, A., 1164.  
 alkali or sulphate, sulphate content of liver after taking, A., 1164.  
 photometric micro-analysis of, B., 450, 658.  
 determination in, of iron, colorimetrically, B., 50.  
 Lake water of Japan, nitrogen and phosphorus in, A., 594.  
 of Takasukanuma, Saitama, iron and manganese in, A., 38.  
 Rain water, formaldehyde in, A., 1106.  
 from Geneva, A., 829.  
 River water near Damascus, salts in, A., 1014.  
 of Makisch and Sava rivers, conductivity of, A., 829.

#### NATURAL WATER:—

River water of the Rance, salinity of, at Chatelier, A., 1227.  
 of the Snake and Clear Water rivers, purification of, B., 962.  
 of the Tees, causes of death of salmon and sea trout smolts in, B., 626.  
 Sea water, determination of density of, A., 38.  
 density and vapour pressure of, A., 1083.  
 evaporation of, (P.), B., 822.  
 variations of  $p_H$  in, A., 247.  
 reducing power of, A., 594.  
 solubility of calcium carbonate in, A., 38.  
 resistance of calcium sulphoaluminate to, B., 549.  
 stability of carbon dioxide in, A., 1228.  
 liquid carbon dioxide in depths of, A., 829.  
 action of iodine in, A., 1227.  
 occurrence and determination of iron in, A., 923.  
 action of, on mild steel, B., 605.  
 lessening corrosion of iron or steel tanks by, (P.), B., 868.  
 preservation of wood in, B., 800.  
 effect of addition of calcium oxide to, in aquaria, B., 754.  
 rectification of, in aquaria, with sodium bicarbonate and calcium oxide, B., 754.  
 of Cape Cod, phosphate, nitrate, and nitrite in, A., 594.  
 of Passamaquoddy Bay, silica in, A., 1014.  
 tropical, lime precipitation in, A., 829.  
 detection in, of manganese, A., 243.  
 of waste sulphite liquors, B., 626.  
 determination in, of carbon dioxide and titratable base, A., 922.  
 of copper, A., 714.  
 of nitrates, A., 710.  
 of planktonic organisms, (P.), B., 578.  
 Spring and mineral water, Acquarossa, analysis of, A., 1106.  
 of Barèges, radioactivity of, A., 247.  
 of Corgas, constants and radioactivity of, A., 492.  
 of the Königsquelle on Boračova, A., 714.  
 from Madesimo, A., 1106.  
 of Mt. Alaghez, A., 358.  
 of Onè di Fonte, A., 714.  
 of Palmyra, salts in, A., 829.  
 of Rogaške Slatine, A., 829.  
 of Sambor, mineral content of, A., 1227.  
 Spanish, cations in, A., 247.  
 subthermal, at Sutinsko, analysis of, A., 38.  
 of Thuès les Bains, radioactivity of, A., 594.  
 Vrnjačka Banja, Arandelovac, and Mladenovac, catalytic properties of, A., 1004.  
 determination in, of silicic acid, A., 243.  
 Water analysis:—  
   analysis of, B., 162.  
   graphical calculations for, B., 866.  
   graphical representation of minerals in, B., 1106.  
   with regard to its purification, B., 242.  
 determination of, by distillation, A., 486; B., 206, 531.  
   by Dolch's method, A., 486.  
   by xylene method, A., 1226.  
   apparatus for, B., 579.  
   in fatty acids, B., 70, 152.  
   in saturated air, A., 339.

**Water analysis:—**

determination of, in presence of alcohols, aldehydes, and acetals, A., 921.  
 electrical apparatus for, in cereals, cement, etc., (P.), B., 734.  
 microchemically, in coal and solids, B., 403.  
 in explosives, B., 208.  
 in gases, B., 326.  
 in molasses, B., 41.  
 in starch products, B., 42.  
 determination in, of total alkalis, volumetrically, B., 290.  
 of *B. coli*, B., 626, 1106.  
 of boron, A., 242.  
 of organic carbon, B., 818.  
 iodometrically, of active chlorine in presence of nitrites and ferric salts, B., 578.  
 of residual chlorine in presence of manganese, B., 370.  
 of copper and lead, B., 818.  
 of hydrogen sulphide, B., 1106.  
 of dissolved oxygen, in presence of organic matter or hypochlorites, B., 290.  
 of phosphates, A., 242.  
 of silica, A., 354.  
 of silicic acid, colorimetrically, A., 34.  
 of sulphates, B., 50.  
 of sulphuric acid, B., 50.  
**Water baths**, regulation of temperature of, A., 592.  
 regulator for, A., 1014.  
**Water pipes**, corrosion of, B., 149.  
 corrosion-inhibiting calcium carbonate protective layers in, B., 185.  
**Watercress**, control of leaf beetle on, B., 955.  
**Waterproofing**, compositions for, (P.), B., 676.  
 of bags for saltpetre, etc., (P.), B., 60.  
 of cellulose materials, (P.), B., 798.  
 of fabrics, (P.), B., 933.  
 materials for, (P.), B., 722.  
 of fibrous materials, (P.), B., 1025.  
 of textiles, (P.), B., 1076.  
 of walls, etc., (P.), B., 889.  
**Waterworks**, sterilisation of sand filters in, B., 402.  
 corrosion of iron in, B., 552.  
 at Dessau, B., 82.  
**Wattle bark**, B., 809.  
 determination in, of tannin, B., 652.  
**Wax or Waxes**, production of, (P.), B., 270.  
 bleaching of, (P.), B., 947.  
 determination of melting point of, B., 850.  
 relation of freezing point and melting point of, B., 193.  
 retention of solvents by, B., 946.  
 chemistry of, B., 116.  
 "coalification" of, B., 245.  
 oxidation of, (P.), B., 378.  
 removal of, from materials, (P.), B., 539.  
 recovery of alcohols of high molecular weight from, (P.), B., 378.  
 production of coating and impregnating solutions from, (P.), B., 118.  
 manufacture of compositions containing, (P.), B., 436.  
 production of flakes of, (P.), B., 947.  
 "aniline point" of, B., 850.  
 determination of hydroxyl number of, B., 849.  
 "retention number" of, B., 873.  
 artificial, production of, (P.), B., 474.  
 bees-, solubility of, B., 313.  
 bleaching of. See under Bleaching.  
 determination of, in candles, B., 1090.

**Wax or Waxes**, of high melting-point, production of, (P.), B., 715.  
 Japan, dibasic acids of, A., 313.  
 paraffin. See Paraffin wax.  
 plant, properties of, A., 99.  
 water-immiscible, production of colloidal solutions of, (P.), B., 777.  
 fluorescence analysis of, B., 1090.  
**Weeds**, control of, with chlorates, B., 124.  
 in lawns, by spraying, B., 124.  
**Weed-killers**, B., 618.  
 sodium chlorate, B., 618.  
**Weevils**, bean, effect of ethylene oxide on reproductivity of, B., 202.  
 strawberry root. See *Brachyrhinus ovatus*.  
**Weights**, standardisation of, A., 1106.  
 molecular, determination of, A., 713, 714, 1013.  
 by depression of m.p., A., 925.  
 of dissolved substances, A., 328.  
 cryoscopic determination of, A., 1105.  
 micro-determination of, A., 1227.  
 vapour pressure determination of, A., 565.  
 of colloids, A., 462.  
 in different states of aggregation, A., 1193.  
 high, polymorphism of substances with, A., 910.  
**Welding**, chemico-thermal process for, (P.), B., 188.  
 bronze for, (P.), B., 1087.  
 electrodes for, (P.), B., 898.  
 fluxes for, (P.), B., 1037.  
 rods for, (P.), B., 311, 991.  
 aluminothermic, acceleration of, (P.), B., 389, 471.  
 arc, (P.), B., 1123.  
 apparatus for, (P.), B., 1124.  
 electrodes for, (P.), B., 114, 267, 432, 611, 732, 804.  
 coated electrodes for, (P.), B., 646.  
 covered electrodes for, (P.), B., 734.  
 metal electrodes for, B., 390.  
 rods for, (P.), B., 350.  
 atomic hydrogen, B., 187.  
 electric, (P.), B., 152.  
 apparatus for, (P.), B., 1037.  
 potassium fluxes for, B., 387.  
**Wells**, filters for, (P.), B., 293.  
 oil. See Oil wells.  
**Wettability**, of solids and liquids, determination of, with Reade's iriscope, A., 224.  
**Wetting** and ultra-porosity, A., 804.  
**Wetting agents**, manufacture of, (P.), B., 13, 56, 95, 138, 173, 221, 252, 332, 337, 415, 495, 540, 592, 636, 671, 763, 769, 792, 793, 797, 832, 928, 973, 1020, 1071, 1072, 1114.  
 treatment of textile materials with, (P.), B., 839.  
 for mercerising liquors, (P.), B., 338.  
 sulphonated abietenes as, B., 172.  
 comparison of, by drop-number method, B., 1019.  
**Wheals**, formation of, A., 648.  
**Wheat**, effect of plant nutrition on composition of, B., 478.  
 stimulation of growth and metabolism in, A., 660.  
 effect of seed dips on germination and growth of, B., 75.  
 assimilation and translocation of plant nutrients in, during growth, B., 38.  
 physiological effect of boron on, A., 664.  
 effect of calcium deficiency on roots of, A., 666.  
 growth of, in magnesium solutions, A., 666.  
**Wheat**, influence of potash on assimilation of, A., 890.  
 gluten content and specific gravity of, B., 958.  
 rate of absorption of water by, B., 481.  
 kernels, swelling of, B., 860.  
 dynamics of carbohydrates in, A., 549.  
 fertilisation of, with ammonia and nitrates, B., 1096.  
 effect of nitrogenous fertilisers on, B., 123.  
 distribution of organic phosphorus in, B., 574.  
 protein tests on, B., 398.  
 testing of, for milling and baking quality, B., 480.  
 baking quality of, B., 860.  
 evaluation of milling quality of, by viscosity tests, B., 1051.  
 resistance of, to rust, A., 206.  
 treatment of rust in, B., 362.  
 storage of, B., 78.  
 manufacture of extract of, (P.), B., 747.  
 as food and seed, A., 1296.  
 examination of, in Wood's slight, B., 365.  
 Brazilian, analyses of, B., 1051.  
 Durum, regional and seasonal variations in pigmentation of, B., 1051.  
 hard winter, distribution of reserve substances in, A., 974.  
 Khapli, yellow colouring matter of, A., 1256.  
 from Montes Claros, State of Minas Geraes, B., 700.  
 frosted, of the 1928 crop, milling and baking quality of, B., 444.  
 spring, Western Canadian, milling and baking quality of, B., 575.  
 winter, manuring of, B., 569.  
**Wheat germ**, A., 784.  
**Wheat-germ oil**, antioxidant action of, B., 312.  
**Wheat grains**, absorption of solute from solutions by, A., 1181.  
**Wheat-smut**, action of mercury salts on, A., 890.  
 trimethylamine from spores of, A., 1178.  
**Wheat straw**. See under Straw.  
**Whey**, dried, growth-promoting value of, A., 962.  
**White lead**, manufacture of, electrolytically, (P.), B., 1041.  
 precipitated, particle size and colour of, B., 234.  
**White metal**, fusion of tin residues and, in reverberatory furnaces, B., 187.  
**Whiting**, B., 1127.  
 for use in rubber, B., 1043.  
**Widmannstätten structure**, A., 685.  
**Willemite**, crystal structure of, A., 114.  
 synthetic, A., 715.  
**Wilson chamber**, investigations with, A., 210, 672.  
**Windows**, pressure, lens effect of, A., 827.  
**Wines**, rubber hose for use in production of, B., 365.  
 clarification of, by potassium ferrocyanide, B., 204.  
 action of agar-agar in, B., 1051.  
 effect of method of distillation on, B., 814.  
 distillation and rectification of, (P.), B., 573.  
 distillates, law of mass action for, B., 364.  
 evaluation of, B., 43.  
 and their distillates, evaluation of factory and laboratory preparations of, B., 43.  
 decolorising power of carbon for, B., 620.  
 radioactivity of, B., 859.  
 grey fraction of, B., 364.  
 acidity of, B., 204.

- Wines**, volatile acidity of, B., 619.  
 measurement of mid-acidity colours of, B., 619.  
 organic acids of, B., 573.  
 increasing alcoholic strength of, (P.), B., 620.  
 removal of alcohol from, (P.), B., 620.  
 acid, manufacture of, B., 443.  
 Algerian, lactic acid in, B., 619.  
 bilberry, colour changes in, B., 859.  
 bottled, changes in, during storage, B., 1133.  
 fruit, detection of, by Werder's method, B., 44.  
 grape, detection of fruit wines in, B., 281.  
 Grecian type, composition and production of, B., 619.  
 Malaga, sugars and dry extract in, B., 573.  
 Moselle, Saar, and Ruhr, 1930 and 1931, proportion of tartaric acid to total free acid in, B., 1133.  
 natural and sweetened, detection of, B., 619, 654.  
 overclarified, B., 573.  
 pepsin, loss in activity and formation of turbidity in, B., 623.  
 port, bacterial contamination of, B., 655.  
 red, residual sugar in, B., 281.  
 determination in, of free and total sulphur dioxide, B., 620.  
 red and dessert, detection of fruit wine in, B., 43.  
 sloeberry, B., 443.  
 S. African, heavy metals in, and their treatment with potassium ferrocyanide, B., 859.  
 sweet, butyric acid in, B., 364.  
 white, free sulphur dioxide in, B., 1133.  
 detection in, of added water, B., 365.  
 of benzoic, salicylic, cinnamic acids, and esters of *p*-hydroxybenzoic acid, B., 281.  
 of bilberry juice, B., 525.  
 of salicylic and benzoic acid, B., 700.  
 of sorbitol, B., 44.  
 determination in, of acidity, B., 282.  
 influence of sulphur dioxide and carbon dioxide on, B., 620.  
 of volatile acids, B., 44, 746, 1004.  
 of lactic acid, B., 281, 1051.  
 of potassium and tartrates, B., 814.  
 of succinic acid, B., 1051.  
 of tannin, B., 77.  
 of tartaric acid, B., 1133.
- Wine must**, relation of sulphurous acid and compounds of aldehydic and ketonic function in, B., 783.
- Wine vinegar**. See under Vinegar.
- Winters colorata**, essential oil of, B., 864.
- Wires**, furnaces for heat-treatment of, B., 682.  
 tensile tests on, at low temperatures, B., 680.  
 distortion of, on passing through a draw plate, B., 846.  
 plating or coating of, (P.), B., 610.  
 chromium-plating of, (P.), B., 28.  
 rubber insulating coverings for, (P.), B., 739.  
 cold-drawn, magnetostriction of, B., 387.  
 electric, insulation for, (P.), B., 734.  
 resistance, production of, (P.), B., 557.  
 insulating coating on, (P.), B., 353.
- Wireworms**, effect of soil reaction on, B., 1130.
- Wogonin**, constitution of, A., 64.
- Wollastonite**, synthesis of, A., 131.  
 heat of formation of, A., 1092.
- Women**, college, protein intake and basal metabolism of, A., 962.
- Wood**, relation of cellulose to lignin in, A., 605.  
 moisture in, B., 308.  
 retention of moisture by, B., 1120.  
 drying apparatus for, (P.), B., 485.  
 kilns for drying of, (P.), B., 468, 660, 1033.  
 separation of cellulose, etc., from, B., 15.  
 carbonisation of, (P.), B., 873.  
 digestion of, (P.), B., 142.  
 soda- and sulphate-digestion of, B., 335.  
 sulphite digestion of, (P.), B., 462.  
 formation of hydrochloric acid in, B., 1116.  
 apparatus for distillation of, (P.), B., 828.  
 distillation products of, B., 919.  
 recovery of, (P.), B., 1017.  
 recovery of tar in destructive distillation of, (P.), B., 875.  
 heating of, with tar phenols under pressure, B., 984.  
 effective capillary dimensions of, A., 470.  
 effect of chemical treatment on permeability of, B., 385.  
 penetration of electrolytes into, B., 385.  
 forced penetration of liquids into, B., 385.  
 fillers for pores of, B., 65.  
 chemistry of, B., 1022.  
 action of moderate heat on, A., 725.  
 lamination of, (P.), B., 889.  
 saccharification of, B., 334; (P.), B., 480.  
 by Scholler-Tornesch process, B., 654.  
 preservation of, B., 385; (P.), B., 264, 938.  
 emulsions for, (P.), B., 602, 889.  
 by fluosilicates, B., 550, 1120.  
 by water-soluble salts, B., 229.  
 in sea water, B., 800.  
 in wet climates, B., 385.  
 preservation of posts of, B., 842.  
 preservatives for, B., 25, 800; (P.), B., 148, 465.  
 application of preservatives to, (P.), B., 773.  
 conditioning of, for impregnation with preservatives, (P.), B., 938.  
 impregnation of, B., 1120; (P.), B., 1033.  
 in uncut state, (P.), B., 107.  
 with corrosive sublimate, (P.), B., 264.  
 treatment of, for shuttles, (P.), B., 800.  
 fireproofing of, (P.), B., 107.  
 protection of, against borers, with pine oil, B., 507.  
 control of stain and mould fungi on, in storage, B., 889.  
 antiseptic action of higher fatty acids against fungi attacking, B., 308.  
 chemistry of white rot of, A., 195.  
 change in composition of, during decay, B., 384.  
 colouring of, (P.), B., 345.  
 adhesion of cellulose paints to, (P.), B., 234.  
 coating of, with creosote paints, etc., (P.), B., 385.  
 priming paints for, B., 194.  
 two-coat spray painting on, B., 194.  
 durability of paints over, treated to repel termites, B., 194.  
 enamel-like coatings for articles of, (P.), B., 308.  
 uniting of other surfaces and, (P.), B., 107.  
 veneer for gluing upon, (P.), B., 98.  
 reproduction of surface markings of, (P.), B., 528.
- Wood**, used by Ancient Egyptians, B., 384.  
 for construction of chemical plant, B., 627.  
 identification of fragments of, B., 229.  
 artificial, manufacture of, (P.), B., 345.  
 Australian, chemistry of, B., 1081.  
 rich in colophony, bisulphite cooking of, B., 594.  
 English oak, hemicelluloses of, A., 202.  
 fossil, from Sydney Harbour Colliery, A., 249.  
 French colonial, B., 836.  
 home-grown, characteristics of, B., 148.  
 impregnated, determination in, of mercury, zinc, fluorine, and arsenic, B., 1032.  
 Japanese, hygroscopic equilibria in, B., 403.  
 resistance of, to fungus, B., 1032.  
 of Karafuto, B., 766.  
 Mediterranean, water balance of, in summer, A., 786.  
 Philippine, composition of, B., 385, 773.  
 resinous, and its sawdust, carbonisation of, B., 134.  
 pulping of, (P.), B., 976.  
 of Siam, analysis of, B., 1032.  
 teak, tectoquinone in, A., 784.  
 "Todo-" and "Ezo-matsu," of Karafuto, B., 1022.  
 waste, destructive distillation of, (P.), B., 1112.  
 production of fuel gas from, B., 1064.  
 production of wall boards, etc., from, (P.), B., 602.  
 determination in, of methoxyl groups, B., 594.
- Wood fibres**, production of, (P.), B., 796.  
 use of, for papermaking, B., 15, 177.  
 treatment of, for manufacture of viscose, etc., (P.), B., 97.
- Wood oil**, apparatus for thickening of, (P.), B., 313.
- Wood pulp**, production of, (P.), B., 501, 720, 1024, 1025, 1075.  
 use of concentrated alkali in, B., 380.  
 recovery of resinous by-products in, (P.), B., 462.  
 reduction of sulphur compounds in, B., 929.  
 corrosion in mills for, B., 836.  
 classification of, by selective screening, B., 380.  
 treatment of, by percolation, (P.), B., 501.  
 beating of, B., 673.  
 bleaching of. See under Bleaching.  
 chlorination of, B., 837.  
 cooking of, (P.), B., 720.  
 digestion of, (P.), B., 837.  
 determination of lime in liquors from, B., 542.  
 circulation of liquors in digestors for, (P.), B., 768.  
 removal of liquors from digestors for, (P.), B., 882.  
 influence of black liquor on sulphate digestion of, B., 673.  
 preheating sulphite liquors for, B., 673.  
 pumps for, B., 673.  
 production of cellulose fibres from, (P.), B., 543.  
 production of dry plates of, (P.), B., 502.  
 cuprammonium viscosity test on, B., 1023.  
 pebble-mill test on, B., 717.  
 "flour" in, B., 1073.  
 high  $\alpha$ -cellulose, production of, (P.), B., 142, 768.

(o-Xylene, *Me:Me*=1:2; m-xylene, *Me:Me*=1:3; p-xylene, *Me:Me*=1:4.)

Wood pulp, chemical, production of, (P.), B., 501, 720, 768.  
 treatment of, (P.), B., 930.  
 chemical and mechanical, determination of moisture in, (P.), B., 543.  
 ground, manufacture of, (P.), B., 501.  
 mechanical, treatment of, with sulphite liquors, (P.), B., 462.  
 determination of, in paper, B., 638, 1024.  
 of low pentosan content, production of, (P.), B., 976.  
 refined, production of, (P.), B., 768.  
 sulphite, manufacture of, B., 718; (P.), B., 719.  
 bleaching of. See under Bleaching.  
 reddening of, B., 542.  
 white, production of, (P.), B., 142.  
 determination in, of methoxyl groups, B., 594.  
 Wood sap, A., 204.  
 Wood-spirit oils, heavy, phenols in, B., 972.  
 Wood-sugar. See under Sugar.  
 Wood's light, applications of, B., 292.  
 Wool, scale structure of, A., 415.  
 cystine as factor in production of, A., 1274.  
 machines for scouring of, (P.), B., 502.  
 effect of temperature and  $p_H$  of scouring bath on, B., 415.  
 recovery of neutral grease from washing water from, (P.), B., 233.  
 cleansing of, from tar and paint stains, (P.), B., 257.  
 treatment of, (P.), B., 256.  
 emulsion oiling of, B., 835.  
 oil for processing of, B., 1116.  
 carbonisation of, B., 1115.  
 isoelectric point of, B., 1022.  
 chemical affinities of, B., 640.  
 increasing affinity of, for dyes, B., 544.  
 reserve salts for, from tin compounds, (P.), B., 252.  
 production of unshrinkable finishes on, B., 721.  
 prevention of bleeding of dyed textiles on, (P.), B., 1117.  
 basic amino-acids of, A., 184.  
 decomposition of rufanates, flavianates, picrates, and picronolates by means of, A., 1182.  
 chemical tests on, B., 795.  
 assimilation of sulphur in growth of, A., 877.  
 mildew on, B., 835.  
 bacteriology of, B., 879.  
 detection and estimation of chemical damage in, B., 795.  
 Wool fibres, swelling of, in water and alkali, A., 911.  
 effect of chromic acid and dichromates on, B., 415.  
 detection of damage to, with indigo-carmine, B., 59.  
 Wool fleece, production of, by merino sheep, A., 772.  
 Woollen fabrics, piece-dyed, faults in, B., 797.  
 Woollen goods, treatment of, with chlorine, (P.), B., 721.  
 knitted, unshrinkable finish for, B., 337.  
 Worts, regulation of temperature of, during fermentation, (P.), B., 628.  
 behaviour of hop resins during boiling and fermentation of, B., 203.  
 determination of degree of fermentation of, B., 1133.  
 sterility of filter pulp for, B., 958.  
 enclosed refrigeration of, B., 320.  
 separation of deposit from, B., 43.

Worts, relation between sugar content and attenuation of, B., 443.  
 tannins in, B., 858.  
 "congress," measurement of turbidity of, B., 126.  
 cooler, non-sterility of, B., 958.  
 determination of source of, by analysis, B., 814.  
 electrometric titration of, B., 525.  
 determination of  $p_H$  of, colorimetrically, B., 397.  
 Wounds, materials for treatment of, (P.), B., 288.  
 compressed gauze dressings for, (P.), B., 161.  
 difficultly-soluble pastilles for treatment of, (P.), B., 128.  
 Writing tablets, white, production of, (P.), B., 518.  
 Wyomingtonite, potash and alumina from, B., 884.

## X.

$\alpha$ -Xanthatoundecic acid, A., 408.  
 Xanthenylamine, dithio-, A., 621.  
 Xanthhydrol, thio-, action of acids on, A., 621.  
 Xanthic acid, velocity of decomposition of, A., 816.  
 complex salts, magnetic susceptibility of, A., 10.  
 copper salt, composition of, A., 144.  
 esters, manufacture of, (P.), B., 973.  
 hydrolysis and dissociation of, A., 474.  
 effect of replacement of methyl by alkyl and aryl on stability of, A., 497.  
 alkyl esters, promoter activity of, in flotation, B., 66.  
 bornyl and menthyl esters, effect of solvents and temperature on optical rotation of, A., 561.  
 cellulose ester, formation of, A., 725.  
 X-ray examination of, A., 370.  
 ethyltriacetylxylosyl ester, and its potassium salt, A., 45.  
 potassium ethyl ester, surface tension of, and pine oil, A., 460.  
 menthyl benzyl, *p*-nitrobenzyl, and  $\beta$ -propyl esters, A., 497.  
 Xanthine-oxidase, effect of uric acid on action of, A., 649.  
 Xanthone, and thio-, methoxy-derivatives of, A., 860.  
 bromonitro- and nitro-amino-, A., 1268.  
 Xanthonearsinic acid, and amino-, bromonitro- and nitro-, A., 1268.  
 Xanthone-1:3-di-*o*-thiobenzoic acid, thio-, A., 1259.  
 Xanthophyll, isolation of, from flowers, A., 1257.  
 as source of vitamin-A, A., 972.  
 effect of, on growth of rats, A., 200.  
 Xanthoquinoline,  $\beta$ -amino-, A., 1268.  
 Xanthoquinoline- $\beta$ -arsinic acid, A., 1268.  
 Xanthoraphin, A., 1043.  
 Xanthoria, life history of, A., 888.  
 Xanthorrhæa, B., 117.  
 destructive distillation of, B., 1015.  
 Xanthyllic acid, comparative rate of hydrolysis of, with guanilylic and adenylic acids, A., 71.  
 ribosephosphoric acid from, A., 497, 1236.  
 Xenon, atomic weight of, A., 106.  
 spectrum of, A., 208.

Xenon, Aston's dark space in, A., 2.  
 emission in, A., 315.  
 ionisation of, by slow alkali ions, A., 4.  
 crystal structure of, A., 325.  
 enrichment of gases in, (P.), B., 422.  
 excited, dissociation of hydrogen by, A., 1187.  
 Xenon lamp. See under Lamp.  
*Xenopus laevis*, relation of pituitary to calcium metabolism in, A., 655.  
 o-Xenylcarbamide. See 2-Diphenyllylcarbamide.  
 $\alpha$ -*p*-Xenylethylamines, and their hydrochlorides, A., 263.  
*p*-Xenylthiocarbimide, A., 154.  
 4-Xenylthiourethane, A., 154.  
 Xylan, pyranose structure of, A., 44.  
 production of material containing, (P.), B., 595.  
 Xylene, equilibrium of phenol, sodium oleate, water, and, A., 335.  
 additive compound of, with phosphorus pentachloride, A., 608.  
 o-Xylene, ozonisation of, and its isomerism, A., 259.  
 m-Xylene, equilibrium of, with benzene, A., 1083.  
 m-Xylene, 4-chloro-5-bromo-6-fluoro-2-nitro-, and 4-fluoro-6-amino-, and its acetyl derivative, and 6-nitro-, A., 945.  
 4:6-dinitro-, condensation of, with aldehydes, A., 56.  
 3-m-Xyleneazo-2:4-dihydroxyquinoline, A., 623.  
 3-m-Xylenehomophthalimide, A., 624.  
 m-4-Xylenol, 5-bromo-6-fluoro- and 6-fluoro-, A., 945.  
 sym-Xylenol, production of, from crude coal-tar acids, B., 825.  
 4-Xylenol-5-carboxylic acid, manufacture of arylamides of, (P.), B., 173.  
 as-o-Xylidine, equilibrium of, with carbon dioxide, A., 1204.  
 m-4-Xylidine *p*-toluenesulphonate, A., 375.  
 m-4-Xylidine, 5-bromo-6-fluoro-, 5-bromo-6-fluoro-2-nitro-, and 6-fluoronitro-, and their derivatives, A., 945.  
 vic-m-Xylidine, complex salt of, with cuprous chloride, A., 376.  
 Xylitol triphenyl methyl ether, A., 42.  
*p*-Xyloquinone-*d*-camphorsulphone, A., 947.  
 Xylosan, and its diacetyl derivative, A., 368.  
 Xylose, effect of molybdates on rotatory power of, A., 1190.  
 bacterial fermentation of, A., 1169.  
 effect of administration of, on liver glycogen and nitrogen excretion, A., 1282.  
 Xylose, thio-, tetraacetate, A., 45.  
 d-Xylose, action of dilute alkali on, A., 723.  
 absorption of, in the organism, A., 1282.  
 ethylmercaptal, and its tetra-acetate, A., 146.  
 Xylothiose. See Xylose, thio-.  
*p*-Xylarsinic acid, and 6-amino-, and their derivatives, A., 408.  
 m-Xylylene diacyanide, A., 1134.  
 S-*p*-Xylylenebis-*p*-bromophenacyltetramethyldiammonium dibromide, A., 262.  
 o-Xylylene-1:8-naphthalene, A., 842, 1130.  
 9-*p*-Xylyl-2-methyl-9-oxanthrone(10)-1-carboxylic acid lactone, A., 275.  
 $\alpha$ -m-4-Xylyl- $\beta$ -(2-naphthyl)thiocarbamide,  $\alpha$ -6-chloro-, A., 154.  
 1-m-Xylyltetrazole, 5-amino-, A., 1044.  
 5-thiol-, A., 405.  
 m-4-Xylylthiocarbimide, 6-chloro-, A., 154.  
 Xylylthiourethanes, and chloro-, A., 154.

## Y.

Yangonolactone, and its derivatives, A., 748.

Yarns, manufacture of, with centrifugal spinning machines, (P.), B., 257.

apparatus for drying of, (P.), B., 883.

machines for moistening and cooling of, (P.), B., 720.

steaming and moistening of, (P.), B., 839.

treatment of, with liquids, (P.), B., 225, 305.

conditioning of, (P.), B., 677.

machines for treatment of hanks of, (P.), B., 883.

device for supporting windings of, which are to be unwound, (P.), B., 1075.

crêping of, (P.), B., 883.

composition for use in ornamentation of, (P.), B., 932.

detection of defects in, B., 795.

artificial, manufacture of, (P.), B., 336, 930.

twisting and winding of, (P.), B., 18.

of reduced lustre, production of, (P.), B., 930.

mixed artificial staple and silk or wool fibres, production of, (P.), B., 1025.

knitting, treatment of, (P.), B., 19.

linen. See Linen yarns.

textile, production of, (P.), B., 595, 639.

treatment of, (P.), B., 542.

skein-bearing reels for, with liquids, (P.), B., 304.

crêping of, (P.), B., 979.

Yatren, pharmacology of, in diseased animals, A., 878.

Yeast, classification of strains of, A., 1167.

manufacture of, B., 858; (P.), B., 77, 365, 443, 525, 911.

from molasses, (P.), B., 42.

use of potato flakes in, B., 1051.

influence of nutrition with nitrogenous foods on yield of, in the aëration process, B., 443.

growth of, in butter, B., 45.

effect of metals at a distance on, A., 778.

in mixed sugars, A., 93.

hydroxy-acid as agent for stimulation of, A., 1065.

stimulation of growth of, by thallium, A., 778.

action of potassium chloride on growth temperature of, A., 544.

fermentation by, A., 882.

and acetoacetic acid, A., 194.

increasing of fermentative power of, (P.), B., 958.

cell-free fermentation by, A., 194.

influence of oxygen in fermentation and metabolism of, A., 544.

amidases of, A., 1289.

depressor substances of, A., 1061.

enzyme in, which oxidises alcohol, A., 1289.

dehydrogenating enzymes of, A., 303.

ergosterol content of, A., 93.

fall of, A., 195.

$\beta$ -hydroxybutyric acid formation by, A., 305, 306.

invertase from, A., 305, 967.

nucleic acid from, and its alkaloidal salts, A., 544.

enzymic fission of, A., 1167.

oxygen consumption and carbon dioxide production of, A., 428.

vitamin-B<sub>1</sub> and -B<sub>2</sub> in, A., 782.

zymase fermentation by, A., 428.

Yeast, metabolism of, in relation to fermentation of beer, B., 43.

action of iodine on, A., 428.

relation between arsenic content of hops and, B., 957.

esterification of arsenic acid by, A., 882, 1065.

compounds lethal to, A., 778.

bakers', effect of ageing on activity of, B., 958.

beer, influence of rice on, B., 126.

dried, action of ultra-violet light on, A., 887.

culture, differentiation and classification of, by the spectroscope, B., 1132.

irradiated, effects of, compared with those of vitamin-D in cod-liver oil, A., 974.

feeding of cows on, A., 1176.

osmophilic, A., 882.

accessory food substance for, A., 306.

in honey, B., 321.

pressed, clarification of molasses for production of, (P.), B., 524.

analysis of, A., 486.

top, nutritional physiology of, A., 306.

determination in, of nitrogen, B., 203, 746.

Yellow IV, derivatives of, A., 265.

Yellow fever, electrophoresis with virus and protective bodies of, A., 545.

in monkeys, A., 768, 1057.

Yoghurt. See under Milk.

Yohimba alkaloids, A., 760.

Yohimbine, identity of, with quebrachine, A., 760.

isoYohimbine, A., 760.

Ytterbium, spectra of, A., 440.

Ytterbium halides, A., 30.

Yttrium, crystal structure of, A., 1078.

Yttrium alloys, effect of hot rolling on mechanical properties of, A., 567.

Yttrium detection:—

detection of, A., 673.

Yuri-mimuzu, control of, with *Leucothoe grayana*, B., 698.

## Z.

*Zea mays*, permeability of iodine solution and of water to seeds of, A., 205.

Zeaxanthin, A., 520.

isolation of, from *Senecio doronicum*, and its esters, A., 1257.

Zeeman effect, A., 1072.

in intermediate coupling, A., 2.

in quadrupole lines, A., 440.

Zeolites, A., 715.

preparation of, (P.), B., 103.

adsorption of gases by, A., 458.

dehydration of gels of, by freezing, A., 911.

removal of slightly soluble salts by, A., 30, 584.

base-exchange reactions of, A., 459.

crystal water in, A., 903.

base-exchange, manufacture of, (P.), B., 340.

of the Platten Lake region, Hungary, A., 493.

"Zewaphosphate," cropping trials with, B., 1129.

Zinc, production of, (P.), B., 556.

electrolytically, B., 554.

anodes for, B., 682.

Coley plant for, at Tunis, B., 27.

recovery of, from its ores, (P.), B., 151, 512.

Zinc, recovery of, from sulphide ores, (P.), B., 895.

by a sulphuric acid fuming and decomposition process, (P.), B., 190.

recovery of tin, lead, antimony, bismuth, and precious metals from residues from distillation of, (P.), B., 1123.

rolling of, B., 892.

furnaces for smelting of, (P.), B., 607.

furnaces for reduction of, (P.), B., 109.

spectrum of, under high-frequency excitation, A., 2.

anomalous dispersion in, A., 668.

K-absorption spectrum of, A., 316.

fluorescence of, A., 891.

as a galvanic element, B., 230.

electrolysis of, B., 606.

electrolytes containing, B., 607.

electrodeposition of, (P.), B., 473.

anodes for, B., 986.

effect of organic substances on, A., 580.

electroplating of, on aluminium, (P.), B., 351.

atomic heat of, A., 684.

condensation of vapour of, (P.), B., 895.

condenser for vapours of, (P.), B., 111, 556.

diffusion of, in copper and its alloys, A., 800, 989.

diffusion velocity of mixed foil of copper and, A., 907.

solution of, in aqueous solutions of salts, A., 1003.

velocity of solution of, in acids, A., 702.

crystals, growth of, A., 797, 1191.

slipping and consolidation in, A., 1080.

velocity and emission work of photo-electric electrons from, A., 980.

electrical and thermal conductivity of, A., 905.

translation of, A., 564.

alternating torsion tests on, A., 219.

effect of  $p_H$  on corrosion of, in oxygenated aqueous solutions, B., 510.

protection of, against corrosion, (P.), B., 1123.

production of corrosion-resistant sheets of, (P.), B., 267.

coating of, with an organic salt, (P.), B., 231.

coatings, crystal structure of, A., 796.

adherence of, B., 186.

influence of nickel on oxidation of, A., 1099.

poisoning and activation of, A., 1004.

treatment of concentrates containing, (P.), B., 895.

removal of, from lead slags, B., 230.

from mattes and slags, (P.), B., 556.

electrolytic, application of Preece test to deposits of, B., 1122.

low in iron, preparation of, from zinc scrap, B., 510.

sheet, protection of, against "white rust," (P.), B., 987.

rolled, Poisson ratio of, B., 510.

Zinc alloys, (P.), B., 847.

die-casting, (P.), B., 512, 943, 989.

wrought, (P.), B., 895.

with alkaline-earth metals, production of, (P.), B., 731.

with aluminium, (P.), B., 311.

improvement of, A., 799.

equilibria of, B., 681.

with aluminium and copper, A., 455; (P.), B., 847.

colouring of, (P.), B., 311.

with aluminium and tin, (P.), B., 847.

with antimony and copper, (P.), B., 471.

- Zinc alloys with cadmium, electrodeposition**  
 of, from cyanide baths, B., 987.  
 for electroplating, B., 109.  
 electroplating with, (P.), B., 1088.  
 with cadmium and copper, electrodeposition of, from cyanide baths, B., 430.  
 with copper, A., 566, 990.  
 structure of, A., 1081.  
 $\beta$ -phase in, A., 907.  
 determination of volatile constituents of, B., 892.  
 and with silver, crystal structure of, A., 801.  
 with copper and mercury, A., 456.  
 with copper and silver, A., 687.  
 with iron and mercury, A., 456.  
 with lead, eutectic, B., 186.  
 with manganese, A., 116, 1196.  
 with nickel, A., 801.
- Zinc bases :—**  
 Zinc tetrammine permolybdate, A., 484.  
 Zinc compounds, luminescence of, A., 110.  
 Zinc salts, complex, activation of, A., 578.  
 Zinc arsenite, manufacture of, (P.), B., 886.  
 carbonate, hydrolysis of, A., 1205.  
 velocity of decomposition of, A., 1211.  
 chloride, pure, preparation of, A., 1008.  
 purification of, (P.), B., 261.  
 removal of excess chlorine from solutions of, (P.), B., 599.  
 action of, on mercuric oxide, A., 822.  
 basic, A., 914.  
 fluoberyllate, A., 583.  
 hydroxide, crystalline, heat of formation of, A., 575.  
 iodide, double salts of, A., 822.  
 nitrate, hexahydrate, equilibrium of, with nickelous nitrate hexahydrate, A., 1198.  
 oxide, manufacture of, (P.), B., 465.  
 apparatus for, (P.), B., 146.  
 from solutions of the sulphate, (P.), B., 935.  
 from zinc ash, B., 101.  
 properties of, A., 988.  
 Becquerel effect with, A., 581.  
 fluorescence of, A., 1011.  
 adsorption and reactions at surfaces of, A., 458.  
 equilibrium of, with aluminium and silicon oxides, A., 574.  
 reduction of, in presence of copper, A., 579.  
 action of, on mercuric chloride, A., 822.
- Zinc oxide, formation of spinel from**  
 chromic oxide and, A., 801.  
 brick-red, A., 1099.  
 finely-divided, production of, (P.), B., 678.  
 determination of, in presence of the sulphide, B., 677.  
 phosphide poisoning. See under Poisoning.  
 sulphate, activity coefficient of, A., 999.  
 solubility of, A., 125.  
 equilibrium of, with ammonia and water, A., 697.  
 ammoniates, A., 350.  
 sulphide, manufacture of, (P.), B., 885.  
 from ores, (P.), B., 935.  
 effect of high pressures on phosphorescence and radioactivity of, A., 5.  
 scintillation of, A., 793.  
 precipitation of, with a buffered solution, A., 1011.  
 in presence of copper sulphide, A., 481.  
 phosphorescent, preparation of, B., 420.  
 crystal structure of, A., 11.
- Zinc organic compounds, optically active,**  
 A., 30.  
 Zinc dibutyl, rearrangement of, A., 1050.
- Zinc detection, determination, and separation :—**  
 detection of, by Rinmann's-green test, A., 923.  
 determination of, with ferrocyanide, A., 243, 355, 1103.  
 potentiometrically, B., 1084.  
 in coloured alloys, B., 553.  
 volumetrically, A., 489.  
 in alloys and ores, B., 1083.  
 in biological material, A., 978.  
 in brass and other alloys, B., 986.  
 in cadmium, B., 845.  
 in impregnated wood, B., 1032.  
 in milk, A., 638.  
 separation of, from aluminium, A., 489, 1223.
- Zinc blende.** See Blende.  
**Zinc castings, plating on,** B., 187.  
**Zinc green,** B., 71.  
**Zinc minerals of N.S.Wales,** A., 248.  
**Zinc ores, treatment of,** (P.), B., 556.  
 removal of cadmium from, (P.), B., 112.  
 roasting of, B., 387.  
 reduction of, (P.), B., 556, 847, 989.
- Zinc ores, coked agglomerates of, for**  
 reduction, (P.), B., 556.  
 recovery of indium from, (P.), B., 1087.  
 containing ferrites, treatment of, (P.), B., 684.  
 containing ferrous iron, treatment of, (P.), B., 1119.  
 oxidised, treatment of, (P.), B., 885.  
 flotation of, (P.), B., 556.  
 roasted, coked agglomerates of, (P.), B., 895.  
 sulphide, roasting of, (P.), B., 802.  
 containing copper and iron, sulphatising roasting of, (P.), B., 152\*.
- Zinc white,** B., 314.  
 manufacture of, (P.), B., 118, 197, 1041.
- Zinc yellow, preparation of,** B., 71.
- Zincilactic acid, sodium salt,** A., 269.
- Zincimandelic acid, sodium salt,** A., 269.
- Zincisalicic acid, sodium salt,** A., 269.
- Zircon, in N. Brazil,** A., 493.
- Zirconium, B., 429.**  
 production of, electrolytically, (P.), B., 897.  
 infra-red arc spectra of, A., 1188.  
 transition point of, A., 219.  
 oxide layers on, A., 450.  
 manufacture of compound refractories from, (P.), B., 507.
- Zirconium alloys, resistance of, to corrosion,**  
 B., 429.  
 with iron, A., 330.
- Zirconium halides, vapour densities and**  
 pressures of, A., 1195.  
 dioxide (*zirconia*), band spectrum of, A., 211, 896.  
 X-ray examination of minerals of  
 magnesia and, B., 229.  
 X-ray and microscopic examination of  
 silicate melts containing, B., 104.  
 melting point of, A., 453.  
 sols, coagulation of, A., 1202.  
 technical applications of, B., 504.
- Zirconium determination and separation :—**  
 determination of, in rocks, A., 356.  
 separation of, A., 1012.
- $\beta$ -Zirconium, crystal structure of,** A., 325, 450.
- Zirconium ores, production of refractory**  
 bricks from, B., 64.
- Zygosaccharomyces, A., 1065.**
- Zymosterol, determination of, polarimetri-**  
 cally, in systems with ergosterol and  
 cholesterol, A., 955.